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INFORMATION REQUIREMENTS OF THE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION'S
SAFETY, ENVIRONMENTAL HEALTH, AND OCCUPATIONAL
MEDICINE PROGRAMS

Adrienne A. Whyte, Ph.D

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OF THE NATIONAL AERONAUTICS AND SPACE
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Prepared for
NASA Office of Safety and Environmental Health

Contract NASW-3119



BioTechnology, Inc.

3027 ROSEMARY LANE • FALLS CHURCH, VIRGINIA

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Abstract

The information requirements of the Safety, Environmental Health, and Occupational Medicine Programs at the National Aeronautics and Space Administration were studied to assess the need for a computerized information system. A survey of the internal and external reporting and recordkeeping procedures of these programs was conducted at Headquarters and five National Aeronautics and Space Administration Centers. This report describes these reporting and recordkeeping procedures and the major problems associated with them. The impact of probable future requirements on existing information systems is evaluated. This report also presents the benefits of combining the safety and health information systems into one computerized system and recommendations for the development and scope of that system.

Introduction

Computerized information systems are a potentially powerful tool for managers and professionals in Government and industry. They are particularly useful where data generation and utilization rates are high. Management information systems support the planning, control, and operational functions of an organization by furnishing uniform and timely information to assist in decision making (Kennevan, 1974).

The development of a carefully designed management information system may be a necessity for the safety and health programs at the National Aeronautics and Space Administration (NASA). Recognizing this, the NASA Directors of Safety and Environmental Health and Occupational Medicine decided to study the requirements, benefits, and costs of a combined information system for safety and health. There are several reasons why a computerized information system for safety and health should be developed at NASA. The volume of the current information requirements has already exceeded the capabilities of the manual system in use. Within the next year, new Occupational Safety and Health Administration (OSHA) standards will significantly increase the safety and health reporting and recordkeeping requirements. Compliance with these requirements will be costly and time consuming without an efficient information system. In addition to the need for a computerized information system based on the volume of the information requirements, NASA has been directed to develop a safety and health management information system by Executive Order 11807 and by OSHA.

It is clear that an improved information system for safety and health must be developed. Steps have been taken to explore the issues in the development of such a system and whether it should be computerized. The first step in the development of an information system must be a study of the information requirements of those who will use it. The second step should be an analysis of the benefits which will result from an improved system. This report should satisfy both of those goals. The information in this report is based upon a survey of the information requirements of the Safety, Environmental Health, and Occupational Medicine Programs

Methods of the Information Requirements Survey

In order to determine the reporting and recordkeeping requirements of the Safety, Environmental Health, and Occupational Medicine Programs, a survey was conducted at NASA Headquarters and selected NASA Centers. Members of the Safety, Environmental Health, and Occupational Medicine Programs at Headquarters were asked about their reporting and recordkeeping requirements. Lists of their external and internal reports, recordkeeping requirements, problems, and recommendations for an improved system were prepared. These lists were reviewed as they were developed in meetings with the safety and health professionals. Copies of the report forms and records used were collected for an analysis of their content. The reporting and recordkeeping requirements of the three programs were evaluated for their interdependence.

A second phase of the survey involved a review of the laws, regulations, standards, and orders affecting the safety and health reporting and recordkeeping requirements. These were compared with the lists of requirements to evaluate the current information systems in light of existing requirements. Proposed OSHA standards and Civil Service Commission (CSC) regulations were reviewed for their impact on NASA's safety and health programs. Evaluations of Federal agency safety and health programs which had been conducted by the General Accounting Office and the House of Representatives Committee on Government Operations were also considered.

The third phase of the survey consisted of trips to five NASA Centers to review their safety and health reporting and recordkeeping requirements. The Centers visited were chosen because of the different nature of their operations. They were Ames Research Center, Dryden Flight Research Center, Goddard Space Flight Center, Johnson Space Center, and Kennedy Space Center. At each of these Centers, surveys of their reporting and recordkeeping requirements were made. The interactions between Center and Headquarters information systems were reviewed. Problems with their records systems were also discussed. Copies of report and record formats were gathered.

The information from this survey was analyzed and compiled into this report on the information requirements of the Safety, Environmental Health, and Occupational Medicine Programs. These requirements are subdivided into external reporting requirements, internal reporting requirements, and recordkeeping requirements for the three programs at Headquarters.

Common Center information requirements for each program are also discussed. The major problems associated with the current reporting and recordkeeping systems at Headquarters and the Centers are considered. The impact of probable future requirements on the current safety and health information systems is evaluated. The last two sections of the report concern the benefits of a combined safety and health computerized information system and recommendations for such a system.

Some Definitions

There are several terms used repeatedly in this report. For clarity, definitions of these terms are presented here

External reporting requirements: requirements for reports to Federal, state, and local agencies

Internal reporting requirements: requirements for reports within NASA

Recordkeeping requirements: requirements for the maintenance of records within NASA. These requirements may be imposed by NASA or by other Federal agencies.

THE SAFETY PROGRAM

The Safety Program at NASA Headquarters is part of the Office of Safety and Environmental Health. The Safety Program has two functions: management of the NASA-wide Safety Program and administration of the Headquarters program. As a result of these two functions, the Safety Program has a dual reporting and recordkeeping burden. For the purposes of this review, these requirements will not be differentiated because they all contribute to the workload of the Safety staff members at Headquarters.

External Reporting Requirements

OSHA

The Office of Safety and Environmental Health is required to submit an *Annual Report on Occupational Safety and Health* to the Secretary of Labor. The need for an annual report was specified in the Occupational Safety and Health Act of 1970 and the Executive Order 11807. The annual report for 1976, the most recent report available, addressed the following topics:

- Description of the Safety and Health Organization
- NASA Policy
- Funding
- The NASA Safety Program and Organization
- The NASA Health Protection Program
- Training
- Promotion and Employee Involvement
- Research and Engineering
- Accident, Injury, and Illness Investigation, Analysis, and Reporting
- Standards
- Committees
- Inspections

- Achievement of Planned Goals and Objectives for CY 1976
- CY 1977 and Beyond.

The enclosures to the report included statistics on staffing, sample management instructions, and safety promotional materials from the NASA Centers.

The annual report for OSHA is prepared by members of the Safety Program at Headquarters during the first quarter of each calendar year. It is due at OSHA on April 1 of each year.

OSHA also requires Federal agencies to submit an annual Summary Report of Federal Occupational Injuries and Illnesses (OSHA Form 102F) and an annual Summary Report of Federal Occupational Property Damage Incidents (OSHA Form 102FF). These reports are required by the authority of the Occupational Safety and Health Act of 1970 and the regulations of the Department of Labor (CFR, Title 29, Chapter XVII, Part 1960).

The information on the 102F is an annual summary of the information taken quarterly from the OSHA 100F log which, at Headquarters, is kept in the Health Unit of the Occupational Medicine Program. A copy of the 102F is shown in Appendix A. It includes statistics on cases of recordable occupational injuries and illnesses, deaths, lost workday cases, cases without lost workdays, and terminations and transfers as a result of occupational injuries or illnesses.

The 102FF, shown in Appendix B, includes statistics on incidents, property damage, and tort claims associated with accidents involving automobiles, cranes, lifts, boats, aircraft, other vehicles, and fires. All of these statistics are necessary for incidents involving property damage of one hundred dollars or more. The 102FF also lists statistics on vehicle usage.

Each NASA Center, including Headquarters, sends the 102F and 102FF directly to OSHA Headquarters within 45 calendar days after the end of each year. The Centers send copies of these annual reports to the Headquarters Safety Program. In addition, the Centers send the information on the 102F and 102FF to Headquarters every quarter. It is also a requirement that the 102F and 102FF be posted at each NASA Center no later than 45 days after the close of the calendar year.

The forms must be posted for at least 30 days. The 102F and 102FF are used by the Secretary of Labor in meeting the requirements of Section 24 of the Occupational Safety and Health Act of 1970 to collect, compile, and analyze occupational safety and health statistics.

In addition to the annual reports on occupational accidents, injuries, and illnesses, NASA is required by regulation to report serious accidents by telephone or telegraph to the Secretary of Labor within two working days. Reportable accidents are those which are fatal to one or more employees, result in hospitalization of five or more employees, or involve property damage of one hundred thousand dollars or more. The report must relate the circumstances of the accident, any resultant actions taken by the agency, the number of fatalities, and the extent of any injuries.

National Fire Prevention and Control Administration

The Safety Program submits an annual report on Federal Fire Losses to the National Fire Prevention and Control Administration of the U.S. Department of Commerce. The report is submitted on Form FPC-9. It includes information on the number of fires, property loss, injuries, and fatalities for fires in aerospace vehicles, buildings and their contents, forests, grass and tundra, ships, and other categories. The National Fire Prevention and Control Administration requests that Federal agencies submit this information voluntarily.

Internal Reporting Requirements

Annual Mishap and Injury Report

Every year, the Office of Safety and Environmental Health publishes a *NASA Mishap and Injury Data* report. This report includes statistics and narrative reports on NASA's accidents and occupational injuries and illnesses for the year. The table of contents, presented in Appendix C, shows that the report is a comprehensive summary of NASA's accident and injury experience. The report is prepared in booklet form by members of the Safety Program. The statistics for the report are compiled from information supplied by the Center Safety Programs. The report is widely distributed throughout the agency. Although there is no requirement that the report be distributed outside NASA, copies are sent by the Director of Safety and Environmental Health to safety and health professionals in other Federal agencies.

Accident Cause Analysis Reports

Accident Cause Analysis Reports are summaries of occupational injuries which are sent to the Headquarters Safety Program by the Center Safety Offices every quarter. NASA NMI 1712.1 requires that they be sent within 10 days of the end of each quarter. NASA Form 345 is used for the reports. A copy of this form is shown in Appendix D. Each report categorizes for each injury the part of the body injured, agency involved, type of accident, unsafe act or mechanical condition, and type of injury. Form 345 shows monthly totals, quarterly totals, and totals to date for all injury categorizations. There is also a space on the form for remarks. The Accident Cause Analysis Reports are filed at Headquarters and used for statistical purposes.

Office of Workers' Compensation Programs (OWCP) Monthly Statements

Each month the Safety Program receives from OWCP a statement of injury and illness claims received from each NASA Center. The statement lists the injured employees, their injuries, and whether lost time was involved. These statements are in the form of computer printouts. The Safety Program sends copies of the statements to the Center safety and health directors. At some Centers, these statements are cross-checked with Center records on occupational injuries and illnesses and are used to validate the employment status of the employees listed.

Mishap Reports

NASA Centers (including Headquarters) are required to report certain types of mishaps to the Director of the Safety Program at Headquarters. The format for these reports is determined by the severity of the mishap. Table 1 defines the four major categories of mishaps within NASA.

The *NASA Safety Manual* requires that immediate reports of Type A accidents be made by telephone to the Director of Safety at Headquarters. The information which must be transmitted is shown on NASA Form 1367, the Telephone, Preliminary and Progress Report for a NASA/NASA Contractor Mishap. This form is used to record the accident information by the safety professional at Headquarters who receives the call. A copy of Form 1367 is shown in Appendix E. Some Centers also report Type B accidents and other incidents in this manner. Once the telephone report is received at Headquarters, copies of it are distributed to 20 individuals at Headquarters who request

notification of accidents. The NASA Form 1367 is also used for preliminary and progress reports which are usually made by telecommunication. Formal investigation reports for Type A accidents must be submitted to Headquarters.

Table 1
Definitions of Mishap Categories at NASA*

Type A Accident — A mishap causing death, disabling injury to five or more persons, or damage to equipment or property exceeding \$100,000. An investigation board is mandatory.

Type B Accident — A mishap causing disabling injury to four or fewer persons or damage to equipment or property exceeding \$10,000 but under that of a Type A Accident. An investigation is mandatory. Whether an investigation board is used is optional and depends on the circumstances

Incident — A mishap of less-than-accident severity to personnel or property, more specifically, where injury to personnel is judged to be sufficiently minor as to result in no time loss beyond the day of the mishap or where damage to equipment or property is construed to be less than \$10,000 and greater than \$250. A near-miss occurrence which could have resulted in an accident is also considered an incident.

Mission Failure — Any accident, incident, occurrence, event, or anomaly of such a serious nature that it significantly delays or jeopardizes a mission, prevents accomplishment of a major primary mission objective, or results in a premature mission termination.

NASA Mishap — Any occurrence, event, or anomaly that may be classed as a NASA accident, incident, or mission failure.

*From the *NASA Safety Manual*.

The Headquarters Installation Safety Office is informed of accidents and injuries by telephone (in which case Form 1367 is used) or by the Health Unit on a special memorandum. If the mishap is serious enough to warrant a safety investigation, an accident investigation board is appointed. All Type A accidents must be investigated. At Headquarters, Type B accidents are usually investigated, and some incidents are investigated. The board submits a formal report which usually includes: 1) NASA Form 1389, Mishap Report, 2) NASA Form 1390, 1391, or 1392, report forms for Space Vehicle, Aircraft, and Industrial Mishaps, respectively, 3) a description of the method of investigation, 4) a narrative factual description of the mishap, and 5) a summary of findings and

recommendations. Photographs may be included in the report. Investigation board reports are sent to the Director of Safety and Environmental Health at Headquarters by all Center Safety Programs.

Field Inspection Reports

Every other year, a team of Safety Program professionals representing Headquarters conducts a safety survey at each NASA Center. This survey may include a walk-through inspection in which reports are made for each work area or building inspected. These reports list hazards, potential hazards, and requirements for corrective action. The entire Safety and Environmental Health Program is evaluated. Reports are compiled into a single report for the Center and are submitted to the Center Director before the survey team leaves.

Recordkeeping Requirements

Management Records

The Safety Program Director maintains records on the Safety Programs at each of the NASA Centers. These records include information on the budgets, personnel, and activities of each of the programs. These records are used to evaluate the effectiveness of NASA's Safety Program, and they are essential for efficient program management. Unfortunately, there is no regular mechanism for the submission of these records to the Headquarters Office of Safety and Environmental Health. Most of this information is requested by Headquarters when the annual report for OSHA is prepared.

Mishap Statistics

The Safety Program compiles records from the Centers on accidents and injuries. Some of these records are sent periodically by the Centers. These include Accident Cause Analysis Reports, quarterly OSHA 102F and 102FF reports, quarterly occupational injury and illness data from the OSHA 100F logs at the Headquarters Health Unit, accident notifications by telephone reports, and accident investigation board reports. Other records are sent in response to Headquarters requests for information. One such request occurs during the first quarter of each calendar year when annual reports are being prepared.

Most of the records on accidents and injuries are used for external and internal reports. These records are necessary for the compilation of the annual report to OSHA and the annual *NASA Mishap and Injury Data* report. NASA's statistics on accident frequency and severity rates are computed from these mishap records. As a result, these records are necessary for evaluation of the Safety Program. Mishap reports are also used to determine accident countermeasures and safety trends.

System Safety Analysis Reports

System safety analysis reports (SAR's) are used to record the assessment of risks associated with the operation of particular systems. When SAR's are prepared for manned and automated space hardware programs, copies are forwarded to the Director of Safety and Environmental Health at Headquarters. These copies are filed in the Safety Office for the information of the staff members. Other SAR's are maintained at the Centers.

Inspection Records

Safety inspection reports are kept on file in the Safety Program. Written reports of formal safety evaluations are forwarded to the Director of the Safety Program from the Centers. In addition, records on corrective action taken after hazards have been identified are also kept in the Safety Offices.

Employee Complaints

Employee complaints about hazards at Headquarters are documented in the Safety Office. When special surveys are conducted as a result of these complaints, records on the surveys and any action taken are filed.

Training Records

Records on the training of safety professionals, supervisors, and other employees are kept in the Safety Office. These records are compiled at the end of each year and included in the annual report to OSHA.

Probable Future Requirements

A recent evaluation of NASA's Safety Program by OSHA pointed to the need for a management information system to compile and generate data on mishaps, injuries, inspections, hazards, abatements, training, and other safety activities. NASA and other Federal agencies are under increasing pressure from OSHA to develop computerized safety and health information systems. Such a system is a requirement for the Safety Program and should be developed in the near future.

Related to this management information system are current OSHA recommendations that NASA's Safety Program keep more records than are being kept on training, inspections, and abatements. These records are required by Department of Labor regulations. In addition, there are currently 19 OSHA health standards which require recordkeeping on workplace inspections, training, and abatements. In CY 1978, OSHA is expected to publish approximately 400 new standards. These new standards will significantly increase the recordkeeping requirements for the safety and health programs. Since the Safety Program system of records is inadequate for the maintenance of currently required records, a new recordkeeping system will be necessary to accommodate additional requirements.

Major Problems with the Current System

Management Information

The availability at Headquarters of information on the costs, staffing, and activities of the Safety Programs at the NASA Centers is poor. Currently, the Centers submit this information only when it is requested. Some Centers submit detailed program information; others submit only the minimum required. As a result, the management records kept by the Director of Safety and Environmental Health are incomplete. This problem makes it difficult for the Safety Director to respond to questions from NASA management on issues relating to the Safety Program. In addition, since the Safety Director represents NASA's Safety Program for OSHA and other Federal agencies, he needs timely and accurate information on the Center Safety Programs. Currently, much of this information is unavailable to him.

Mishap Information

There are several problems with the mishap information which is submitted to Headquarters by the Center Safety Programs. These problems involve inconsistent and inaccurate information, lack of accident characteristics or causal data, and the timeliness of the reports. There are differences among the Centers in the types and formats of mishap reports submitted. This is particularly evident in the reporting of incidents. The quarterly records submitted on accidents and injuries are also inconsistent. Some Centers report all mishaps, while others report only OSHA reportable occurrences. There is also a lack of accident characteristics or causal data on mishaps. The House of Representatives Committee on Government Operations and others have criticized Federal agencies for the lack of causal information in their records on accidents and injuries. It was intended that the Accident Cause Analysis Reports would provide this information. However, these reports provide little information that would aid the safety professional in developing accident countermeasures. In fact, the information on the Accident Cause Analysis Reports follows the generally outdated American National Standard Institute system for recordkeeping rather than the OSHA methods currently used for reporting. The third problem with the mishap reports involves the time of their submission. Unless reports are submitted as accidents occur, timely evaluation of the data for trends or similarities is impossible. Unfortunately, many mishap reports are sent to Headquarters expressly for the computation of annual statistics. Thus, there are potential delays in mishap reporting of up to one year.

The management of mishap information from the Centers is another problem. Currently, all information is reviewed, summarized, and filed manually. These tasks and the computation of annual statistics are time consuming for the Safety Program staff members.

With the current mishap records system, it is difficult to compare lost time due to injuries to Continuation of Pay (COP) data. The Safety Program receives lost-time information from several sources. This information is often inaccurate, and it is difficult to cross-check because there are so many offices involved in the workers' compensation program at NASA.

The COP system has become a problem at NASA (and other Federal agencies). The system was adopted by Congress to ensure that injured Government employees continue to receive their pay

while OWCP processes their claims for compensation. COP is an option available to any individual who has suffered a work-related traumatic injury and will lose time from work. The individual may elect to have his regular pay continued rather than take sick or annual leave. COP is available for a maximum of 45 calendar days. Unfortunately, since COP became available, the number of lost-time injuries at NASA has increased. From 1969 to 1973, the average number of lost-time injuries was 82 per year. In 1974, 1975, and 1976, the numbers of injuries were about 119, 128, and 195, respectively. While a number of factors may have contributed to this dramatic increase, it is believed that the COP system played a major role.

It is essential that management study traumatic injuries and the resultant COP in order to account for the increasing number of injuries. As injuries and lost time increase, so do costs. In order to audit lost-time injuries and COP, management will need timely and accurate information on each injury which occurs, any associated lost time, and the form and amount of compensation.

Inspection, Training, and Abatement Records

As previously mentioned, the current recordkeeping system in the Safety Program does not satisfy OSHA recommendations and requirements for the maintenance of inspection, training, and abatement records. Only the institution of a more elaborate information system will satisfy OSHA demands. The system would probably be more efficient if it were computerized.

THE ENVIRONMENTAL HEALTH PROGRAM

The Environmental Health Program at NASA Headquarters is part of the Office of Safety and Environmental Health. The Environmental Health Program coordinates all of NASA's environmental health activities. These activities include industrial hygiene, health physics, environmental sanitation, and training, and they are closely related to the Occupational Medicine and Safety Programs. The major information burden of the Environmental Health Program relates to the recordkeeping requirements at the Centers. These will be described in the section of this report on Center information requirements. The reporting and recordkeeping requirements of the program at Headquarters are described in this section.

External Reporting Requirements

Special Reports

Federal agencies concerned with safety and health often request survey information from NASA. The agencies from which these requests come include the Environmental Protection Agency (EPA), the National Institute for Occupational Safety and Health (NIOSH), and OSHA. The requests usually involve information about the quantities on hand and use of potentially hazardous substances. Past surveys have involved the use of trichloroethylene, methyl chloroform, mercury, polychlorinated biphenyls, and radiation exposures. When a special request for information is made, the Chief of the Environmental Health Program must survey each NASA Center for the required data. After all of the Centers have replied, a NASA-wide report is prepared and sent to the agency that requested it.

Noise Research and Control

The EPA Office of Noise Abatement and Control is required to compile and publish a report on *the status and progress of Federal activities relating to noise research and control* (Section 4(C)(3) of the Noise Control Act of 1972). All Federal agencies must furnish information on their noise research and control program to EPA for this report (Section 4(C)(1)). Until 1974, EPA annually requested detailed data on the noise program at NASA. In 1974, the report submitted by NASA was on the noise research, control, and hearing conservation programs. Since then, EPA's requests

for information have been sporadic. When data are requested, the Chief of Environmental Health at Headquarters compiles the information from the NASA Centers for submission to EPA.

Internal Reporting Requirements

Annual Pesticide Report

An annual report on *Pesticides Used at NASA Installations* is compiled at NASA Headquarters. The report includes information on each pesticide used at the NASA Centers. Before 1977, the report was prepared for the Federal Working Group on Pesticide Management. Although the report is no longer submitted to them, it is still compiled as an internal report and circulated within NASA. A sample page from the 1977 report is shown in Appendix F. The report includes the following information on each pesticide used: purpose for use, application, sensitive areas to be avoided, and special remarks

Field Survey Reports

Every other year, an environmental health survey is conducted at each of the NASA Centers by a team representing Headquarters. The survey may include a walk-through inspection. Before the inspecting team leaves a Center, a survey report is delivered to the Center Director. The report lists problems with the program, hazards in particular work areas, and recommendations for corrective action.

Recordkeeping Requirements

Periodic Surveys

Every year an environmental health walk-through survey is conducted in the two buildings at NASA Headquarters. The inspectors look for potential health hazards in work areas. These hazards could include (but are not limited to) noise, gases, vapors, or temperature extremes. Records are kept for each work area. These records include notes on hazardous or potentially hazardous conditions which should be corrected. All survey records are kept in the Environmental Health Program records.

Complaints and Special Inspections

Special work area inspections are conducted as they are needed at Headquarters by the Environmental Health Program. These inspections may be initiated by the Environmental Health Program Chief or by employee complaints or requests. Inspections which have been conducted in the past have included measurements of carbon monoxide in the garage, solvent vapors, and ventilation problems in work areas. Each of these inspections is documented and filed in the Environmental Health Office. There is no standard format for documentation. When employee complaints or requests are involved, records of the complaints and follow-up actions are also filed.

Material Safety Data Sheets

Material Safety Data Sheets contain information which is used to inform individuals who work with or are exposed to particular products of the hazards involved and the procedures which should be followed for their safe use. Material Safety Data Sheets include information on the product and its ingredients, physical characteristics (e.g., boiling point, solubility), fire and explosion hazards, health hazards, reactivity, spill or leak procedures, protection information, and special precautions. A Material Safety Data Sheet is shown in Appendix G. Material Safety Data Sheets on all General Services Administration products are kept on file in the Environmental Health Office. As of April 1978, these sheets have not been distributed to the Centers. However, some Centers keep their own files of Material Safety Data Sheets. OSHA requires that the information on Material Safety Data Sheets be available to all employees exposed to the substances for which health standards exist.

Chemical Inventories

The Environmental Health Office maintains records on chemical inventories which were conducted by the Centers at the request of Headquarters. These inventories were conducted on particular chemicals (or other hazardous substances) at the request of other Federal agencies or when new OSHA health standards were proposed. Recently, inventories of benzene and acrylonitrile were conducted. The data collected included the quantities stored, information about the people exposed, and the operations in which the substances are used. These data are retained in the records of the Environmental Health Program.

Management Records

The Chief of the Environmental Health Program maintains records on the environmental health activities at each of the NASA Centers. These records are used to make decisions and policies, to indicate compliance with regulations, and for information purposes. They are essential to the effective management of the Environmental Health Program. In addition to Center records, literature from OSHA, NIOSH, and other organizations and services concerned with occupational safety and health is filed in the Environmental Health Office. This information is necessary because the Chief of the Environmental Health Program serves as a consultant to the Centers on laws and regulations.

Records must be kept on the costs and personnel associated with the Environmental Health Programs at the Centers. These records are submitted to the Office of Financial Management by the Centers. Financial Management then sends copies of these records to the Headquarters Environmental Health Office. The records are submitted on NASA Form 1229A, and they include information on costs, including the costs of overhead, equipment, salaries, and personnel, broken down into manhours per activity for civil service, contractor, and other Federal agency personnel. These records are used to monitor the costs and productivity of the NASA-wide Environmental Health Program.

The Center Environmental Health Programs have many reporting and recordkeeping requirements which differ from the Headquarters requirements. Some of the Centers send copies of their reports to Federal regulatory agencies to Headquarters. These are used by the Chief of the Environmental Health Program to monitor Center activities.

Probable Future Requirements

In CY 1978, OSHA is expected to release about 400 new health standards for hazardous substances. These standards will impose new work area monitoring, medical monitoring, labeling, and training requirements on employers who use the regulated substances. These requirements will probably overwhelm the limited resources of the Environmental Health Program. An extensive system of records will be necessary to comply with the standards

Several other new information requirements will be initiated within the Environmental Health Program. The first is related to the extensive medical monitoring which will be required by the new OSHA standards. It will be necessary to correlate physical examination records with substance exposure information. This information will be necessary to monitor the health of NASA employees. It will involve a cooperative effort between the Occupational Medicine and Environmental Health Programs. Once a system for correlating medical and exposure information has been instituted, epidemiological studies of NASA's population will be possible.

In order to maintain exposure information for individual employees, a comprehensive inventory for all hazardous substances will be necessary. This inventory will provide information on the quantities and use of hazardous substances at the Centers. At the least, it will be necessary to inventory all substances for which standards exist. However, if this approach is taken, new inventories would be required when new standards were issued.

OSHA has recommended that NASA Headquarters take a more active role in directing the training program for health and safety professionals and for employees who work with hazardous substances or in hazardous work areas. The Department of Labor has published extensive requirements for training (CFR, Title 29, Part 1960). New training requirements and a system for centralization of training records will add to the recordkeeping burden of the Environmental Health Program.

Major Problems with the Current System

Center Records

The current systems of occupational health and workplace monitoring are not uniform throughout the Agency. As a result, recordkeeping differs from one Center to the next. In general, none of these records are available at Headquarters. However, personnel at Headquarters are frequently called upon to answer questions about the Center Environmental Health Program activities.

This problem applies not only to health and workplace monitoring, but also to all other activities in which the Environmental Health Program is involved. Most of the Centers have regular reports which they send to Federal and state regulatory agencies. Copies of these reports are sent to Headquarters by some of the Centers.

In order to manage the Environmental Health Program, the Chief of the program must have an information system which allows him to analyze the Agency's activities and problems. Since no such system exists, this is currently a problem for the program.

Chemical Inventories

Not only is there no NASA-wide inventory for hazardous chemicals, there are no comprehensive Center inventories either. When the Chief of the Environmental Health Program must report on the use of particular hazardous chemicals, he must ask the Centers to conduct special surveys. The number of surveys which must be conducted is increasing. The special surveys are time consuming, and they may produce unreliable estimates of the quantities of chemicals stored at the Centers.

The lack of a comprehensive inventory is a problem for both Headquarters and the Centers. As more and more chemicals are discovered to produce harmful effects on human health, the requirement for monitoring the use of all potentially hazardous substances increases. Unfortunately, there is no current information system for the use of hazardous substances at the NASA Centers.

Material Safety Data Sheets

Although the Environmental Health Program has Material Safety Data Sheets for many of the hazardous substances used at the Centers, these sheets are not readily accessible at the Centers. The employees who work with the chemicals should have access to information about their toxicity and use. Access to Material Safety Data Sheets is a requirement of the OSHA standards. Some method for distributing information about hazardous substances to the Centers must be devised. It is currently planned to distribute the Material Safety Data Sheets on microfiche.

Compliance with OSHA Standards

Each OSHA health standard has a section on recordkeeping. The standards require that records be kept on all of the exposure monitoring and medical surveillance required by the standards. A proposed OSHA labeling standard will require chemical inventories, training, and accessible Material Safety Data Sheets. Within NASA, those records are not currently being kept with any consistency. This is a problem, and since OSHA plans to release about 400 new health standards in CY 1978, the problem will grow.

The recordkeeping required by the new standard for occupational exposure to benzene (CFR, Title 20, Part 1910.1028) can be used as an example of the extensive records which must be kept on just one substance. At each Center at which benzene is present, the following records must be maintained:

1. dates, number, duration, procedures, and results for all samples taken to determine employee exposures
2. a description of the sampling and analytical methods used
3. type of respiratory protective devices worn
4. name, social security number, and job classification of the employees monitored
5. the physicians' written opinions, results of medical examinations, all tests, and recommendations for each semi-annual physical examination for each employee
6. peripheral blood smear slides of the initial test, the most recent test, and any test demonstrating hematological abnormalities related to benzene exposure for each employee
7. any employee complaints related to benzene exposure
8. a copy of the standard
9. a copy of all information supplied to the physician as required by the standard
10. the employees' medical and work histories.

These records must be kept for at least 40 years or for the duration of employment plus 20 years, whichever is longer. In addition to these records, the training, labeling, and hazard notifications required by the standards will generate new records. This is just one standard. The records system which will be needed to comply with 400 new health standards will severely tax the capabilities of the current Environmental Health Program.

Management Records

In order to get information on the Environmental Health Programs at the Centers, special requests must be made. There is no current system for the regular transmission of information on productivity, costs, services, accomplishments, or problems. When it is necessary to specially request each item of information needed, the reporting burden grows, and timeliness and efficiency decrease. For management purposes, the Environmental Health Program should have a reporting system for programmatic information.

THE OCCUPATIONAL MEDICINE PROGRAM

The Occupational Medicine Program at NASA Headquarters has two functions: management of the NASA-wide Occupational Medicine Program and administration of the Headquarters program. As a result, the Occupational Medicine Program has a dual-reporting-and-recordkeeping burden. For the purposes of this review, these requirements will not be differentiated because they all contribute to the workload of the Headquarters staff members.

External Reporting Requirements

Workers' Compensation

The Occupational Medicine Program has regular external reporting requirements from several Federal agencies. The most comprehensive of these requirements is associated with the Federal Employees' Compensation Act (FECA). FECA (5 U.S.C. 8101 *et seq.*) provides for payment of compensation benefits to employees of the U.S. Government who are injured or disabled while performing their official duties. The responsibility for administering the workers' compensation programs belongs to the Office of Workers' Compensation Programs of the U.S. Department of Labor. At NASA Headquarters, the Occupational Medicine Program has been designated the interface with OWCP.

OWCP has a series of forms which must be used to give notice of injuries, illnesses, and claims. Table 2 lists these forms. All of the information on these forms is considered confidential, and the forms themselves are the property of OWCP.

Form CA-1, Federal Employees' Notice of Traumatic Injury and Claim for Continuation of Pay/Compensation, is the most frequently used form. If an employee is injured in the performance of his duties, a CA-1 form must be completed. The CA-1 must be filed with OWCP within 30 days if any of the following three conditions is appropriate: 1) the injury causes lost time from work, 2) it appears that the injury will result in prolonged treatment; 3) the injury has resulted or will result in medical expense. CA-1 forms are available in the Health Unit.

Table 2
Office of Workers' Compensation Programs Forms

<u>Form No</u>	<u>Title</u>
CA-1	— Federal Employee's Notice of Traumatic Injury and Claim for Continuation of Pay/Compensation.
CA-2	— Federal Employee's Notice of Occupational Disease and Claim for Compensation.
CA-2a	— Notice of Employee's Recurrence of Disability and Claim for Pay/Compensation.
CA-3	— Report of Termination of Disability and/or Payment
CA-4	— Claim for Compensation on Account of Occupational Disease
CA-5	— Claim for Compensation by Widow, Widower and/or Children.
CA-5b	— Claim for Compensation by Parents, Brothers, Sisters, Grandparents, or Grandchildren.
CA-6	— Official Superior's Report of Employee's Death
CA-7	— Claim for Compensation on Account of Traumatic Injury
CA-8	— Claim for Continuing Compensation on Account of Disability
CA-16	— Request for Examination and/or Treatment
CA-17	— Duty Status Report.
CA-20	— Attending Physician's Report
CA-20a	— Attending Physician's Supplemental Report.

Appendix H shows the CA-1 form. Part of this form is completed by the injured employee. The section of the form for the official superior's report is completed and signed by the Medical Records Technician. The Medical Records Technician makes and files a copy of the CA-1 before it is sent to OWCP. CA-1 forms which are completed, but not forwarded to OWCP, are filed in the injured employee's folder in the Office of Personnel. Because the CA-1 is considered confidential, no other copies are made or circulated.

The CA-16, Request for Examination and/or Treatment, is shown in Appendix I. This form is used by the Health Unit when an injured employee is referred to a private physician for treatment. There are two parts to this form, authorization for treatment and the attending physician's report. The Medical Records Technician completes the authorization and attaches a letter and return-address envelope for the physician to return his report to NASA rather than OWCP. After making a copy for the files, the Medical Records Technician forwards the CA-16 to OWCP. A copy is kept in the Occupational Medicine Office.

The CA-2, Federal Employee's Notice of Occupational Disease and Claim for Compensation, and the CA-2a, Notice of Employee's Recurrence of Disability and Claim for Pay/Compensation, are processed in the same way as the CA-1. The CA-2 must be submitted to OWCP within 30 days of the date on which the employee is informed of his illness by a physician.

When an injured employee returns to work or when his disability ceases, the Medical Records Technician files a CA-3 form with OWCP. A copy is kept in the Occupational Medicine Office.

Forms CA-4, CA-5, CA-5b, CA-7, and CA-8 are all claims for compensation. With the exception of the CA-5 and CA-5b, they are filed by the employee in the Occupational Medicine Office where they are copied and then forwarded to OWCP. The CA-4 and CA-7 must be submitted to OWCP within two days of the claim. The CA-8 must be completed every two weeks while the employee is on compensation. The CA-5 and CA-5b, claims for compensation by family members of employees who died in the performance of their duties or as a result of work-related traumatic injuries, may be filed directly with OWCP.

The CA-6 form, Official Superior's Report of Employee's Death, must be filed with OWCP within 30 days after a death due to a traumatic injury. Copies of this form are kept in the deceased employee's file in the Office of Personnel and in the Occupational Medicine Office.

Forms CA-17, CA-20, and CA-20a are physician's reports. With the exception of the CA-17, these are sent to the employee's physician from the Occupational Medicine Office. At NASA, it is requested that the physician complete the report and return it to the Occupational Medicine Office

for submission to OWCP. A copy of each report is filed there. All of these reports are confidential. The CA-17, Duty Status Report, is sent to the injured employee to obtain interim medical reports. It must be completed by his physician and returned to the Occupational Medicine Office. A copy of the CA-17 is then sent to OWCP.

Congressional Inquiries

Occasionally, the Occupational Medicine Program is called upon by the NASA Administrator to provide information to congressional committees. A recent inquiry concerned the Federal Employees' Compensation Act. The Subcommittee on Compensation, Health, and Safety of the House of Representatives Committee on Education and Labor requested detailed statistical information on compensation claims and COP and answers to general questions on the compensation program at NASA. Responses to congressional inquiries must be timely, and they have no special format

Civil Service Commission

The CSC requires NASA to submit two reports on a regular basis, and they are currently requesting a third. These reports are used to meet the CSC responsibilities under Office of Management and Budget (OMB) Circular A-72 to report to the President on Federal agency occupational health programs. A report on the Employee Assistance Program must be submitted annually. The CSC provides a report form (CSC 1210) for this purpose. A copy of this form is in Appendix J. The Employee Assistance Program report includes general information, employee population information, and counseling data for NASA. This information must be compiled from all of the Center Occupational Medicine Programs.

The CSC requires a report on Occupational Health Services every three years. Before FY 1977, this report was submitted annually. The CSC Form 1210 is also used for this report (see Appendix J). Information on NASA's Occupational Medicine Program's size and cost, employee access to services, and services offered is included in this report. As with the Employee Assistance Program report, this information must be compiled from the Centers.

A special study has also been requested by the CSC. It is a cost-effectiveness study of the Occupational Medicine Program at NASA. To date, it has not been conducted.

Drug Enforcement Administration

The Drug Enforcement Administration (DEA) requires medical offices and clinics which maintain supplies of controlled drugs to report any drug loss and to request approval to dispose of controlled drugs. DEA's authority to require these reports comes from the Controlled Substances Act (84 Stat. 1242; 12 U.S.C. 801 *et seq.*) and the regulations of DEA (CFR, Title 21, Part 1300 to End). As a result of this authority, the Occupational Medicine Program issued NMI 1815.1A on June 30, 1977, to incorporate DEA's regulations.

The NMI requires the Drug Control Officer in the Health Unit to report drug loss to the following NASA officials: the Installation Director, the nearest Regional Inspector, the Installation Security Officer, the Director of the Office of Inspections and Security, and the Occupational Medicine Program Chief at Headquarters. The Regional Inspector or Installation Security Officer must report the loss to the DEA's nearest Regional Office on DEA Form 106, Report of Theft or Loss of Controlled Substances. Since, according to DEA, the report of drug loss is the responsibility of the individual in whose name the controlled substances use permit was issued, this report can be considered the responsibility of the Occupational Medicine Program.

DEA also requires that a health clinic request permission to dispose of contaminated, unusable, or excess drugs. The Drug Control Officer in the Health Unit is responsible for this request. DEA Form 41 is used for this purpose.

The DEA also requires clinics to maintain an inventory of controlled drugs. This requirement will be addressed in the section of this report on Occupational Medicine Recordkeeping Requirements.

Communicable Disease Notifications

Another external reporting requirement for which the Occupational Medicine Program may be responsible is the notification of the District of Columbia Department of Human Resources,

Community Health and Hospital Administration, when one of a number of communicable diseases is diagnosed in a Health Unit patient. This responsibility is related to the Center for Disease Control's program for the reporting of communicable diseases. The Department of Human Resources has two forms on which these reports can be made. The report on venereal disease is made on Form DHR 513, and the Disease Case Report, used for all other reportable diseases, is Form DHR 1056. It is not clear whether these reports are the responsibility of NASA's Health Unit or the physicians to whom individuals are referred for treatment.

Internal Reporting Requirements

Occupational Injuries and Illnesses

The Occupational Medicine Program has reporting requirements from a number of other NASA offices. Many of these reports are concerned with occupational injuries and illnesses. Since Occupational Medicine is the NASA Headquarters interface with OWCP, that office is responsible for coordinating the treatment and claims of employees who are injured at work or develop a job-related illness. Other offices at NASA Headquarters require information about occupational injuries and illnesses. As a result, each time an injury or illness is reported, the Medical Records Technician must notify the Offices of Safety and Environmental Health and Payroll and the injured employee's supervisor. Figure 1 shows the flow of reporting events which occurs when a work-related injury is reported at the Health Unit.

The Safety Program must be notified promptly of all injuries so that accident investigations can be conducted. Appendix K shows the form memorandum which is used for this notification. It includes information on the nature and circumstances of the injury. The Medical Records Technician is responsible for sending this memorandum.

The Payroll Office also requires notice of the injury and information about COP or the type of leave the injured employee elects to take. The Payroll Office needs this information to cross-check the time and attendance cards which come from the employee's office. The Medical Records Technician uses a form memorandum to report this information to Payroll. Appendix L shows a copy of this memorandum.

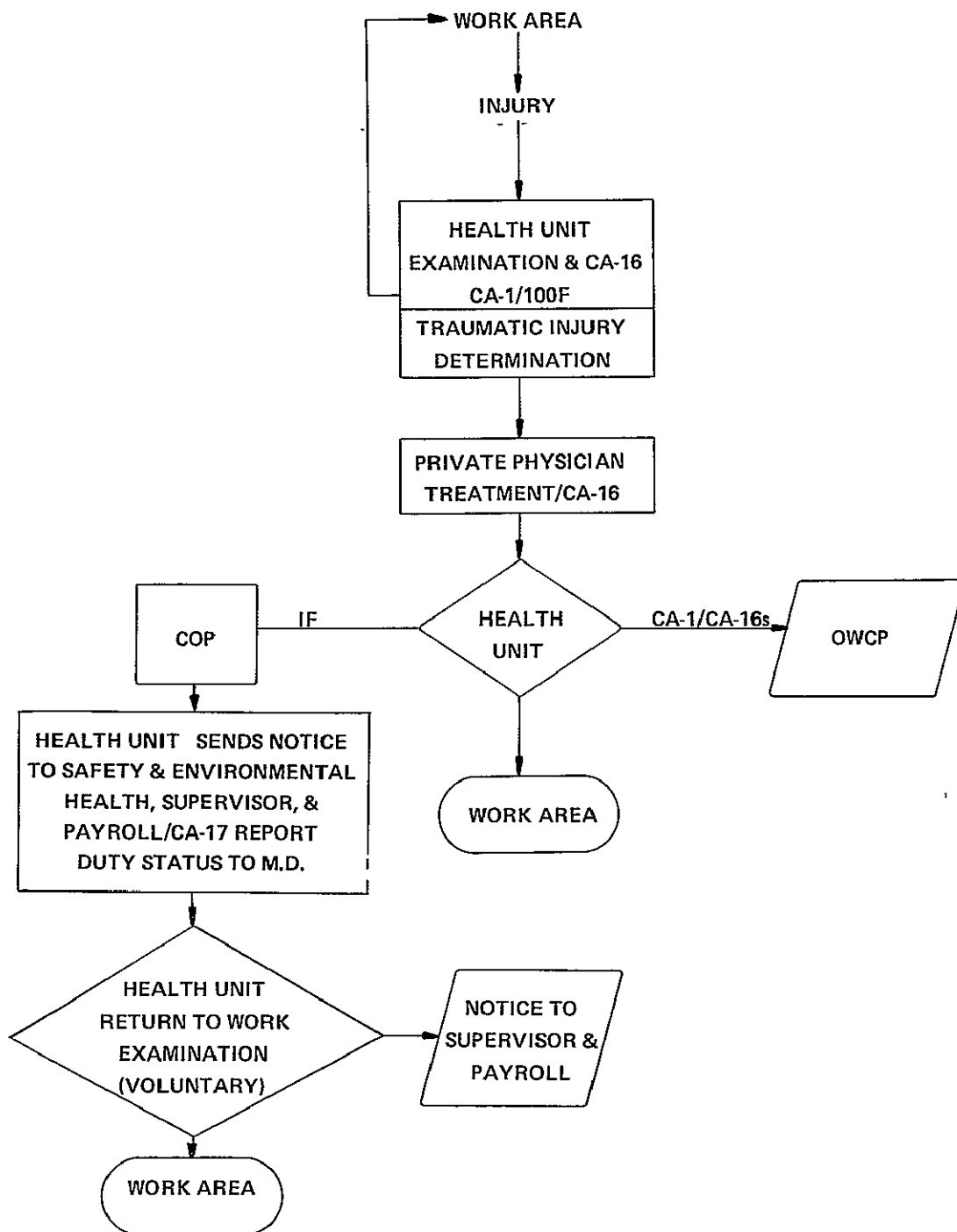


Figure 1. Flow of initial reporting and recordkeeping activities for occupational injuries at NASA Headquarters.

The Medical Records Technician is also required to report the injury to the injured employee's supervisor. If possible, she will visit or call the supervisor. This report is not made in writing.

Continuation of Pay

OWCP requires (Section 10.206 of FECA) that NASA submit a quarterly report on COP. The report is currently submitted by the Office of Personnel and includes Agency-wide totals of the employees provided COP, the total number of workdays for which COP was provided, and the total amount of COP paid to employees during the quarter. The Office of Personnel compiles this information from each of the NASA Centers. Occasionally, the Occupational Medicine Program Chief is called upon to provide or verify these data.

OSHA

OSHA requires that a log of occupational injuries and illnesses be kept by employers subject to the recordkeeping requirements of the Occupational Safety and Health Act of 1970. The log is kept on the OSHA Form 100F by the Health Unit staff. A copy of Form 100F is shown in Appendix M. It contains information about each injury or illness, the employee involved, and the extent and outcome of each case. Some of that information is recorded when the injury is reported; the data on the extent and outcome of each case must be entered when they become available. Quarterly, the 100F information is submitted to the Headquarters Safety Office. The Office of Safety and Environmental Health is required to report the information on the 100F log to OSHA every year.

Management Reports

The Occupational Medicine Program submits two annual reports to NASA management offices. The first, a Productivity Report, is submitted on NHQ Form 137. This report includes fiscal year information on the measured, non-measured, and administrative activities of support contractor and civil service personnel. The Cost Report is submitted to NASA on Form 1229. It includes fiscal year cost data and number of personnel and weekly manhours used for the operation of the Occupational Medicine Program (including the Health Unit, Physical Fitness Facility, and the Employee Assistance Program). The Cost and Productivity Reports are submitted by either the Health Programs Specialist or the Chief of the Occupational Medicine Program.

Annual Occupational Medicine Survey

Another internal reporting requirement involves an annual NASA Health Unit survey conducted by the Chief of the Occupational Medicine Program. This survey is conducted to evaluate implementation of NMI 1800.1A, a NASA policy on the Occupational Medicine Program.' The information requested from the Center Health Units includes general information, information on participation in the program, phasing and resources impact, manpower and cost, and special programs. After the surveys have been returned to Headquarters, a status report which incorporates this information from the Centers is prepared and distributed to the Office of Personnel and the Occupational Program Directors.

Privacy Act Report

The Chief of the Occupational Medicine Program is required by the NASA Privacy Officer to file an annual report which becomes a part of NASA's Annual Privacy Act Report to OMB. OMB requires (under Circular No. A-108) all Federal agencies to report on the administration of the Privacy Act of 1974 (5 U.S.C. 552 a(p)) for all agency systems of records. At Headquarters, the Chief of the Occupational Medicine Program reports on the Human Experimental and Research Data Records (NASA 10HERD) and the System of Medical Records (NASA 10SMED). The report includes information on the scope and nature of recordkeeping, the number of records kept, the numbers of requests for records, analysis of changes to record systems, Agency administration of the Privacy Act, exercise of individual rights, problems, and recommendations. In addition to this annual report, other reports are necessary when modifications to the systems of records are made.

Personnel Actions

A final internal report for the Occupational Medicine Program at Headquarters is the review of the SF2801-B Physician's Statement for Employee Disability Retirement Purposes. The Office of Personnel may send this form to the Program Chief for review when an employee requests disability retirement. The Chief's report and recommendations are made a part of the submission to the CSC.

Recordkeeping Requirements

Medical Records

The Occupational Medicine Program maintains all of the employee medical records from the Health Unit. Table 3 shows a list of the medical records which may be kept in an employee's file.

Table 3
Records Maintained in the Employee Medical Files
at NASA Headquarters

Report of Medical History (SF 93)
Interval medical histories
Executive Health Examiners Physical Examination forms
Laboratory test results
Narrative physician's reports (including histories, physical findings, diagnoses, and recommendations)
Electrocardiograph (ECG) records
Audiometry reports
X-ray records
Dynamic and exercise ECG findings
Pulmonary function test results
Immunization records
Traumatic Injury Determination Work Sheet (if injury occurred)
Health Profile Reports (OMIS)

Medical histories on employees who visit the Health Unit for the first time are recorded on SF93, a standard General Services Administration medical history form. A copy of this form is shown in Appendix N. Interval medical history forms, designed at Headquarters, are completed at each annual physical examination. An example of the interval history is shown in Appendix O.

Another form kept in the patient file is the Executive Health Examiners Physical Examination work sheet. It includes the physician's designation of normal or abnormal for clinical evaluation of 26 parts of the body. It also accommodates blood pressure, heart rate, audiometer findings, vision test results, and a number of other tests. There is space on the form for notes and a narrative statement of health. The physician uses this form as a work sheet during the physical examination.

After the physical examination, the physician dictates an examination summary which is typed and put in the medical file. The summary includes pertinent items of history information, important medical findings and diagnoses, and recommendations. If fiberoptic or proctoscopic examinations were conducted, the physician also dictates those results.

Other physical examination result forms which are included in the medical file are pulmonary function test reports, laboratory test results (including hematology, urinalysis, chemistries, triglycerides, thyroid, and immunology), ECG's, audiograms, and chest X-rays. Within the file, a special file on dynamic ECG's and treadmills is included. The histories, physical examination summary forms, and test results are included from every physical examination. As a result, the medical files for employees who have been at NASA for several years can be quite large.

After the physical examination has been conducted, the Medical Records Technician enters some of the data into the Occupational Medical Information System (OMIS). OMIS, a computerized information system, is used to maintain health profile reports on all Health Unit patients. These reports include laboratory results, diagnoses, dynamic ECG results, and records of visits to the Health Unit. These records are printed out on four separate pages, and they can include 10 years of examination data. An example of a health profile report is shown in Appendix P. Printouts of the health profile report are included in the medical files.

One more record which can be included in the medical file is the "Traumatic Injury" Determination Work Sheet. This form is a memorandum to the medical record from the physician who examines an employee after an occupational injury. The memo includes information on the accident, injury, diagnosis, and whether or not the injury can be defined as "traumatic" by OWCP. This is the only injury-related form which is included in the file.

Audiogram Records

A new system for conducting audiograms and maintaining records for each employee will be implemented in the near future. This system includes the use of an automatic audiometer and a minicomputer for records storage. Simple employee identification data, the 12 thresholds from each audiogram, and some information on the test will be entered into computer storage each time a test is conducted. The records on the minicomputer will be correlated with the OMIS records so that simple analyses of thresholds shifts and patterns of hearing loss can be conducted. It is planned to automatically transfer test data from the audiometer to the computer in the future.

Health Unit Visit Records

The Occupational Medicine Program maintains records on all employee visits to the Health Unit. These records are kept on special logs and in individual medical files. Information on the employees, the purposes of their visits, and treatments administered is maintained. When an occupational injury visit is made, the NASA Form 1375A, Occupational Medicine Statistical Report (Occupational Injury and Illness), is completed and filed.

Management Records

The Occupational Medicine Program maintains records to document all of its internal and external reports and for use in making management policies and decisions. Records must be kept on each NASA Center's Occupational Medicine Program, including information on staffing, productivity, costs, services, contracts, program participation, and more. These records take a variety of forms from memoranda to specially designed forms.

Records on occupational injuries and illnesses are received in the Headquarters Office from many of the Centers. Most of these records are sent on the Occupational Medicine Statistical Report, NASA Form 1375A. The information on this form is coded for computer input. However, at the present time, the information is filed manually.

Frequently, the Chief of Occupational Medicine makes special information requests for programmatic information from the Centers. All of the records received from the Centers are kept for use by management.

Controlled Drugs Inventory

Each NASA Health Unit is required by DEA (see section on Drug Enforcement Administration) to maintain a running inventory of each controlled drug stored and/or dispensed. At Headquarters, this running inventory, or accountability record, is kept on NASA Form 1387 by the nursing staff.

Quarterly, a review and validation of the running inventory is made by the Drug Inventory Officer. This general inventory is also recorded on NASA Form 1387. Periodically, Headquarters reviews these inventories to monitor the use of controlled substances in the Health Units.

Probable Future Requirements

In addition to the current reporting and recordkeeping requirements, the Chief of the Occupational Medicine Program anticipates new information requirements. Some of these requirements will be imposed upon NASA by the CSC and OSHA. Others will be NASA safety and health program requirements. The requirements which can be anticipated are described in this section.

Within CY 1978, the CSC plans to publish a new section in the *Federal Personnel Manual* on environmental medical standards. This section will address the general principles on which Federal medical monitoring standards will be based. Specific environmental medical standards, to be published in the Civil Service Handbook X-118, will follow. These standards will be published for each hazardous substance or environmental hazard. The first one planned for publication will be on noise. The medical monitoring requirements set forth in the standards will be based on the OSHA standards, although, in some instances, they may differ from them.

Since the CSC has the authority to regulate medical monitoring in the Federal sector, the publication of these standards will increase the recordkeeping and scheduling burden of the Occupational Medicine Program. In general, these standards will enforce the OSHA medical monitoring requirements in Federal agencies.

Currently, there are 19 OSHA health standards. Each of these standards requires medical surveillance of employees who are exposed to the substances on which they are based. The current Occupational Medicine recordkeeping system is inadequate for the identification of employees who require job-related examinations. In CY 1978, OSHA is expected to publish approximately 400 new health standards, many of which will affect NASA. These standards will also require medical examinations for exposed employees. NASA's compliance with these standards will overwhelm the examination scheduling and recordkeeping facilities of the Occupational Medicine Program.

At Headquarters, the Occupational Medicine Program administers the workers' compensation program. However, at other Centers, workers' compensation is administered by the Occupational Medicine, Safety, and/or Personnel Offices. As a result of having different offices coordinating the program with OWCP, there is no one managing office to set policies, solve problems, monitor statistics, and keep records. Because the costs of COP and the problems associated with it are rising, the Chief of the Occupational Medicine Program has suggested that the Occupational Medicine Program at Headquarters be the NASA coordinator for occupational injury and illness records. If the Occupational Medicine Program at Headquarters receives this responsibility, recordkeeping requirements for occupational injuries and illnesses will change to include Center records.

Within the Occupational Medicine Program, there will be several new data requirements within CY 1978. The first of these requirements involves monitoring of employees' sick leave. Although the methodology for this monitoring is still uncertain, it will be used as a cost-effectiveness measure for the Occupational Medicine Program.

Another likely requirement for Occupational Medicine will involve a computerized record-keeping system for treadmill and dynamic ECG tests. This requirement will be instituted to standardize these medical records for NASA-wide comparisons. The Occupational Medicine Program will also monitor physical disabilities and deaths of NASA employees for epidemiological purposes.

Major Problems with the Current System

Occupational Injuries and Illnesses

There are a number of problems associated with the current reporting and recordkeeping system of the Occupational Medicine Program. The first problem involves the administration of the workers' compensation program. Currently, there is no way for the Occupational Medicine Program to follow each traumatic injury from occurrence, through COP, to compensation. OWCP provides lists of traumatic injury claims received monthly from each NASA Center. The Office of Personnel collects information from each Center on the number of injuries, lost workdays, and dollars of COP paid in each quarter year. The Safety Program collects accident characteristics data. Some Centers send in data on occupational injuries and illnesses, and others do not. Unfortunately, there is currently no way to integrate these data to compile a case-by-case report on injuries, resultant lost time, and COP.

As previously mentioned in the section of this report on the Safety Program, there is a management need to monitor occupational injury data. The current recordkeeping system must be changed to allow this monitoring.

OMIS

OMIS, the current computerized medical information system, is inadequate. The health profile reports which are generated by OMIS do not include all of the information generated by the physical examination program. Currently, the health profile report contains information on physical examinations, injury and illness visits, and dynamic electrocardiogram analyses. The physical information consists of height, weight, and blood pressure measurements, laboratory test results, and diagnoses from various parts of the examination. Unfortunately, there are no detailed descriptions of physical findings, only half of the laboratory findings, no treadmill test results, and no medical histories.

Only data from the most recent 10 years can be shown on the health profile reports. Repeat tests or occasional items entered on an employee cannot be entered into the record. Physician

recommendations and follow-ups cannot be included. In addition, the diagnostic coding which is currently being used is too general; there is no way to qualify diagnoses.

The problems with the current OMIS records are due to limitations built into the computer program. Some of these limitations are due to lack of foresight, and some are due to hardware and software capabilities. As a result, changes in OMIS will require development of a new system. The new system should rectify the previously mentioned problems and be flexible enough to allow for future additions.

Audiometric Tests

The hearing conservation effort of the Occupational Medicine Program requires that preplacement, periodic, and termination audiograms be given to all NASA employees. There is no centralized information system for monitoring these test results. In order to evaluate and manage the program, trends in test results must be monitored.

Epidemiological Data

The physical examination program at NASA generates a wealth of medical data. These data could be used for epidemiological studies if there were some way to organize and summarize examination results. For example, the diagnoses and positive findings from all physical examinations could be coded and entered into a central data system. With such a system, statistical analyses would be possible. Under the current system, every record in each employee's medical file must be examined before statistical analyses can be conducted. This is prohibitively time consuming. With the growing demands associated with environmental and workplace monitoring, it has become necessary to correlate medical examination data with environmental survey data. This must be done not only for epidemiological purposes but also to protect the safety and health of employees. The current system of medical records cannot accommodate these extensive analyses.

Management Records

In order to get information on the Occupational Medicine Programs at the Centers, special requests must be made. There is no current system for the regular transmission of information on

productivity, costs, services, accomplishments, or problems. When it is necessary to specially request each item of information needed, the reporting burden increases, and timeliness and efficiency decrease. For management purposes, the Occupational Medicine Program should have a standardized reporting system for programmatic information.

Compliance with OSHA Standards

As previously mentioned, OSHA is expected to issue about 400 new health standards in CY 1978. These new standards will substantially increase the medical monitoring requirements for the Occupational Medicine Program. Many new job-related physical examinations will be required. It will be necessary for the Occupational Medicine Program to devise efficient scheduling methodologies to ensure compliance. It will also be necessary to keep medical records for each employee for each regulated substance to which he is exposed for 40 years or longer. The current records system used by the Occupational Medicine Program will not accommodate these new requirements. Thus, within 1978, it will be necessary to revise these recordkeeping and scheduling systems.

NASA CENTER SAFETY, ENVIRONMENTAL HEALTH, AND OCCUPATIONAL MEDICINE PROGRAMS

The administration and structure of the Safety, Environmental Health, and Occupational Medicine Programs differ among NASA Centers. As a result, the reporting and recordkeeping responsibilities in safety and health vary from one Center to the next. This section reviews the Center reporting and recordkeeping requirements in three categories: 1) common reporting and recordkeeping requirements for each program, 2) overlapping requirements, and 3) unique information requirements. Five Centers were surveyed for this information. They were Ames Research Center (ARC), Dryden Flight Research Center (DFRC), Goddard Space Flight Center (GSFC), Johnson Space Center (JSC), and Kennedy Space Center (KSC).

Common Safety Program Requirements

The major reporting and recordkeeping requirements for the Center Safety Programs involve information for OSHA and NASA on mishaps and occupational injuries and illnesses. These and other information requirements are described here.

OSHA Reports and Records

At the Centers surveyed, the reports and records for OSHA are the responsibility of the Safety Program. The 102F and 102FF annual summaries of occupational injuries and illnesses and property damage incidents are submitted to OSHA by the Safety Offices. These reports are also copied and sent to the Headquarters Safety Program. In addition, the information on these forms is sent to Headquarters quarterly.

At the Centers, the 100F log of occupational injuries and illnesses is kept in the Safety Office. The information for this log is usually received from the Health Unit on either the OWCP CA-1 form or a special form used by the Centers. For example, at JSC, the Health Unit uses a Record of Injury (JSC Form 340) to inform the Safety Office of an injury. The Record of Injury includes information on the employee, the injury, and the disposition of the employee.

The Safety Programs are also responsible for the Centers' inputs on safety and health to the annual NASA report to OSHA. Each of the Centers submits detailed information to Headquarters on training, accidents, injuries, staffing, and program activities for inclusion in the annual report. A list of the topics addressed in the report for 1976 appears in the section of this report on the Safety Program at Headquarters. The report is due at OSHA on April 1 of each year.

Accident/Injury Reports and Investigations

At each of the Centers surveyed, the Safety Program receives reports of accidents and injuries, keeps records on these mishaps, and investigates serious accidents. However, there is little uniformity between the Safety Programs on the formats for these reports and records. At most of the Centers, mishaps are reported to the Safety Office. When injuries are involved, the first report of the mishap is often made at the Health Unit. All of the Health Units send some kind of written notification of the injury to the Safety Office. With the exception of JSC, the CA-1 form is sent through the Safety Office at each Center surveyed before it is sent to OWCP. The CA-1 form is used as a record of the injury. In addition to the CA-1, individual Centers also use special forms for injury notifications. For example, at DFRC, several forms are initiated at the Health Unit and sent to the Safety Office, these are the NASA Form 1497 (Attachment to CA-1&2 in lieu of OSHA Form 101F), NASA Form 1375A (Occupational Medicine Statistical Report for Occupational Injury and Illness), and DFRC Form 34 (Supervisor's Accident Investigation Report). At KSC, the Record of Injury (KSC Form 6-2) is used to notify the Safety Office of an injury. All of these special forms are used not only for notification, but also as permanent records on the mishaps.

When Type A and Type B accidents occur, all of the Safety Programs notify Headquarters. These notifications are usually made by telephone and take the form of the NASA Form 1367 (Telephone, Preliminary and Progress Report for NASA/NASA Contractor Mishap). Each Type A and B accident is investigated, and a report of the investigation is prepared. The reports for all Type A accidents are sent to Headquarters. Some Type B accident reports are forwarded.

Reporting and investigative procedures are less consistent when incidents or minor accidents occur. Most of the Center safety professionals reported that the circumstances of the incident are used to determine whether an investigation and subsequent report are warranted. Generally, the

Headquarters Safety Program does not receive notification from the Centers when incidents and minor accidents occur. However, the Centers do keep records on these mishaps.

All of the Safety Programs surveyed still use the discontinued NASA Form 344 (Monthly Injury Experience Report) or an equivalent as a work sheet for recording accidents and resultant injuries. All of the Safety Programs surveyed also send the Accident Cause Analysis Reports (NASA Form 345) to Headquarters regularly. Two of the Centers surveyed send periodic reports to their Center Directors on accidents and injuries. For example, ARC uses NASA Form 344 for this purpose.

Safety Program members at Centers with large onsite contractor populations reported that they regularly receive accident experience reports from the contractors. These reports list the numbers and types of accidents and injuries which occurred and describe corrective measures taken to prevent similar mishaps from occurring in the future.

Report on Federal Fire Losses

At all of the Centers surveyed, the Safety Programs are responsible for preparing the Annual Report on Federal Fire Losses to the National Fire Prevention and Control Administration (NFPCA). These reports are sent to Headquarters before submission to NFPCA.

Inspection Records

Another common element in the Center Safety Program reporting and recordkeeping systems involves safety inspection records. These records are work area or building surveys for hazards. Some of these surveys are conducted by a team representing Headquarters, while others are conducted by Center Safety Program members. Records are kept for all of these surveys. If hazards are found, these records are kept in open files until the hazards are corrected.

Employee Complaints

A majority of the Safety Programs surveyed keep some type of records on employee complaints about hazards. These records vary in format from the formal Employee Safety Discrepancy Report

used at KSC to the inclusion of employee complaints in the minutes of Safety Committee meetings at DFRC. At JSC, employee complaints always lead to an investigation or inspection. These inspections are documented, but the employee complaints are not.

Training

Most of the Safety Programs keep records on training. However, these records are not as extensive as those required by OSHA. The training records are lists of the safety courses given and the participants. Summaries of these records are sent annually to the Safety Program at Headquarters for submission in the annual report to OSHA.

System Safety Analysis Reports

Four of the five Safety Programs surveyed reported participation in the development of System Safety Analysis Reports. These reports are submitted to program directors for use in operational readiness reviews. The reports are maintained at the Centers; they are usually not forwarded to Headquarters.

Common Environmental Health Program Requirements

The Environmental Health Programs at the Centers have extensive recordkeeping requirements. All environmental monitoring, for example, air and water pollution monitoring, must be documented. Extensive records must be kept on radiation sources and their use. All work area surveys must be documented. These and other records must be available at the Centers for inspection by OSHA, EPA, the Nuclear Regulatory Commission (NRC), and other Federal agencies concerned with environmental health. The most common Environmental Health Program information requirements are described in this section.

Radiation Records

NRC requires that detailed and extensive records of the use and disposition of all radioactive materials must be maintained (CFR, Title 10, Chapter 1, Parts 20 and 30). These records must be

available for inspection by NRC at all times. The following is a list of the records and reports the Centers are required to keep.

1. Records of the order or purchase of radioactive materials
2. Records of the receipt of all radioactive materials
3. Records of the transfer of all radioactive materials
4. Records of the disposal of all radioactive materials
5. Applications for the use of radioactive materials
6. Project authorization forms
7. Lists of users and the radioisotopes they use
8. Records of leak tests for all sealed sources
9. Records from radiation surveys on exposure levels
10. Records on film badge readings
11. Records on investigations of possible overexposures
12. Reports to NRC of accidents, overexposures, or losses
13. Reports to employees whose exposures have exceeded certain limits
14. Running inventories of exposures for employees
15. Annual reports of exposures to employees
16. Terminal reports of exposures to employees
17. Training records for employees
18. Forms documenting receipt of regulations by employees
19. Wipe test records
20. Records of air flow in radioisotope hoods and stack emissions
21. Inventories of radiation-emitting machines
22. Inventories of all radioactive sources
23. Calibration records for radiation monitoring equipment

24. Medical records for employees working with radioactive materials

25. Records of NRC inspections (kept on NRC Form 591)

All of these records are kept at Centers where radioactive materials are stored or used. Most of the Centers have special forms for these records. A few are NRC forms; many have been designed at the Centers. For example, KSC has a special form (07-072) for logging the transfer of radioisotopes. GSFC has designed the Health Physics Activity Report (GSFC 23-27), a multipurpose form for work area surveys, leak tests, and laboratory test results.

In addition to all of the records kept on special forms, GSFC and JSC have computerized inventories of radioactive materials. These inventories, developed independently, include information on the isotopes, their activities, users, and locations. They are updated regularly.

The Centers also keep records of lasers and other nonionizing radiation sources. These records are not as extensive as the records kept on ionizing radiation sources and their use. Most of the Environmental Health Programs inventory lasers, microwave sources, and ultraviolet sources if they are present at the Centers. In addition, records are kept on users and training.

Air Quality Monitoring

Three of the Environmental Health Programs surveyed (ARC, JSC, and KSC) regularly monitor air quality. Survey records are kept for all monitoring. For example, JSC conducts periodic surveys of ambient air suspended particulate concentrations and ambient air ozone levels. Special surveys are done for gases (e.g., sulfur dioxide), radiation, and other substances which can affect air quality. Surveys to determine exhaust ventilations are also conducted. The results of all of these surveys are formally documented in the files of the Environmental Health Programs. JSC also prepares an annual Ambient Air Quality Status Report.

Hazardous Substance Inventories

All of the Environmental Health Programs surveyed keep some type of records on the toxic chemicals and other hazardous substances in use at the Centers. None of these records systems are complete inventories of all toxic substances. The Centers differ considerably on the types and

formats of the records. At ARC, maps have been prepared to indicate the locations and quantities of the known carcinogens. In addition, the delivery of all hazardous substances is being monitored at the receiving gate. At GSFC, an inventory of all chemicals ordered since 1975 is kept in index card files and referenced by chemical, code, and building. The information for this inventory comes from a special safety checklist incorporated into the GSFC Purchase Request-Order-Receiving Report (Form 18-26). At some Centers, the only records of toxic substances in use are included in the walk-through survey records. Since these records are filed by building, records on individual chemicals are not easily accessible.

Food Service Sanitation

All of the Environmental Health Programs monitor sanitation in the food service areas. Periodic reports on these inspections include findings and recommendations for corrective action. The format for these reports differs from one Center to the next. At KSC, two specially designed forms are used, the Environmental Health Inspection Report for Food and Beverage Vending Machines (KSC Form 16-255) and the Environmental Health Food Service Sanitation Checklist (KSC Form 16-256). At JSC, narrative reports are prepared for attachment to the Food Service Establishment Inspection Reports (Form 75-137). All food service sanitation reports are kept on record in the Environmental Health Programs.

Pesticide Use

Four out of the five Environmental Health Programs surveyed keep records on the use of pesticides and herbicides. At DFRC, the Facilities Engineering and Maintenance Branch maintains the records. The Centers use a special form, the Pest Control Program Report (FWGPM Form 1) to record the use of each pesticide. The form includes information on the pesticide, the purpose for its use, its application, sensitive areas to be avoided, and special remarks. At the end of each year, copies of all of the forms are submitted to Headquarters for inclusion in the annual report on *Pesticides Used at NASA Installations*.

Water Quality Monitoring

Several of the Environmental Health Programs monitor storm sewers and other effluents for water pollution and potable water systems for water quality. Water pollution monitoring records

can include measurements of the nitrates, coliform bacteria, chemical oxygen demand, phosphates, and heavy metals in drainage water. ARC regularly samples the water in storm drains and ground water for pollution. Records of these measurements are filed by the Environmental Health Program. KSC is required to report to EPA on water pollution to show compliance with the National Pollution Discharge Elimination System (NPDES). The NPDES reports are sent to EPA each quarter year and include a cover letter, summaries of the data, and copies of the EPA Discharge Monitoring Reports on which the data were recorded.

Potable water monitoring is done at all of the Centers surveyed. Records are kept on the monitoring results. These records can include information on bacterial counts, nitrates, chlorine, and turbidity. Although Wallops Flight Center was not surveyed for this report, extensive tests of water quality are required there. At JSC, a monthly report on potable water is prepared by the Environmental Health Program for submission to the Texas Department of Health Resources. The report contains water sampling data. Potable water monitoring at DFRC is done by the Air Force. Records are sent to DFRC only when the surveys discover a problem.

Disposal of Solid Wastes and Hazardous Materials

Under the new Resource Conservation and Recovery Act, all of the Centers will be required to keep extensive records on the disposal of solid wastes. Extensive records on the disposal of hazardous substances in deep wells will also be required. These requirements will become effective in 1978. Currently, some of the Environmental Health Programs are keeping records on solids disposals. For example, a Disposal Data Sheet is used at KSC to record requests for disposals, the type of material disposed, and where the material was sent. JSC is required to submit a monthly report to the Texas Water Quality Board on the quantities of solid waste shipments. That report is prepared by the Environmental Health Program, but submitted by the Facilities Engineering Office.

Material Safety Data Sheets

Most of the Environmental Health Programs maintain Material Safety Data Sheets for at least some of the hazardous substances used. At DFRC and GSFC, these forms are maintained in the

Safety and Environmental Health Offices. At ARC, equivalent forms have been compiled for the 100 most frequently ordered toxic chemicals at ARC. The forms have been distributed to all chemical users in a manual called the *Toxic Chemical Alert!*

Noise Monitoring

The Environmental Health Programs keep records on noise monitoring. In addition to inspections made for all significant noise sources, noise surveys are conducted in response to complaints or special requests. Most of these surveys are done in or near particular work areas at the Centers. However, at ARC, surveys have been conducted in nearby communities. All of these surveys are documented. For example, at JSC, the Industrial Hygiene Survey Report is used. It lists the facility surveyed, the operation involved, a description of the hazard, the personnel exposed, an evaluation of the exposure, and conclusions and recommendations. These reports are prepared for all facilities.

Environmental Health Surveys

In addition to the periodic inspections for particular hazards (e.g., water pollution, radiation, etc.), the Environmental Health Programs conduct general walk-through surveys. These surveys are conducted for each of the buildings or work areas at the Centers. Every other year, surveys are conducted by a team from Headquarters. All other surveys are conducted by the Center Environmental Health Programs. During walk-through surveys, potential health hazards which warrant measurements are identified. Subsequently, measurements using various types of direct reading or recording instruments may be made. Samples may also be collected and analyzed. Most of the Centers have developed special forms for recording survey results. At JSC, an Industrial Hygiene Survey Report form is used for each work area. The form includes information on the facility inspected, the operation, any hazards involved, exposure evaluations, and conclusions and recommendations.

Employee Complaints and Special Surveys

When employees complain about suspected hazards or request hazard evaluations by the Environmental Health Programs, their complaints or requests are documented by most of the

Centers. In all cases, the complaints lead to special inquiries, inspections, or surveys. Records on the results of these surveys and follow-up action are kept by the Environmental Health Programs.

Training

Some of the Environmental Health Programs keep records on training. At those Centers where training records are not kept by the Environmental Health Program, some other office keeps the records. At DFRC, the Personnel Office records all employee training. Where training records are kept, the information usually includes formal course names and participants. Department of Labor regulations and the OSHA health standards require that employees exposed to hazardous substances be trained in the regulations concerning their use, associated hazards, and the means for controlling these hazards. The Centers are just beginning to develop training programs to comply with the requirements of the standards. It is expected that records will be kept on all training conducted to show compliance with the standards. GSFC is developing new training and certification records which will be used by supervisors to document the instructions and training given to employees.

Exposure Monitoring for OSHA

Each OSHA health standard requires exposure monitoring. There are a number of required records and reports associated with this monitoring. In addition, all of the NIOSH criteria documents recommend exposure monitoring. It has been the policy at most of the Centers to follow the recommendations in the criteria documents. As a result, a substantial amount of monitoring is required. For example, the new benzene standard requires that records be kept on all exposure monitoring to show compliance with the regulations. When recommended levels of employee exposure are exceeded, reports must be sent to the employees involved. In addition, written plans must be prepared to document compliance programs. These reporting and recordkeeping requirements fall within the responsibilities of the Environmental Health Programs.

Common Occupational Medicine Program Requirements

The Occupational Medicine Programs at the Centers have similar reporting and recordkeeping requirements to those at Headquarters. The major requirements involve the reports and records

concerning occupational injuries and illnesses and physical examinations. These and other information requirements common to the Centers surveyed are described in this section.

Workers' Compensation

At all of the Centers surveyed, the OWCP CA-1 and CA-2 forms for occupational injuries and illnesses are initiated at the Health Units. The injured employees are given the forms to complete when they go to the Health Units to report injuries. The similarities among the Centers in handling CA-1 and CA-2 forms stop at that point. All of the Centers have developed different methods for routing the CA-1 and CA-2 forms through the Centers to OWCP. These procedures involve the Offices of Safety and Environmental Health, Personnel, and Occupational Medicine.

The CA-16 forms for OWCP are also initiated at the Health Units. These forms are used to authorize treatment by hospitals, clinics, or private physicians. The CA-16 forms are given to the employees to take with them. For DFRC and KSC employees, the treating physicians send the CA-16's directly to OWCP. At ARC and JSC, it is requested that the physicians send the form back to the Occupational Medicine Program for submission to OWCP. GSFC also requests that the CA-16 be returned to the Center, but the Personnel Office processes the form.

The only Occupational Medicine Program at the Centers surveyed which coordinates compensation claims for injuries after 45 days of COP is JSC. At ARC, the Personnel Office is the interface with OWCP on compensation cases, however, the Health Unit does maintain copies of all compensation-related forms.

Table 4 shows the offices involved in the initial steps in processing workers' compensation claims at all of the NASA Centers. An examination of this table should show the tremendous amount of diversity among the Centers in the procedures for processing claims.

Occupational Injuries

In addition to the workers' compensation forms for OWCP, all of the Occupational Medicine Offices keep records and file reports within the Centers on occupational injuries. This is because the Health Units are the first official point of contact for most injured employees. The Centers differ

Table 4
Processing of Workers' Compensation Claims

	ARC	DRFC	GSFC	JSC	KSC	LaRC	LeRC	MSFC	MAF*	NSTL*	WFC	WSTF*	HQS
Serve as source of CA-1	OM	OM	OM	OM	OM or Supv	OM	OM	OM	Safety	OM	OM	Personnel	OM
Review supervisor's report	OM	OM	Personnel	OM	Safety	OM	OM	Safety	Safety	Safety	OM	Personnel	OM
Authorize outside care on CA-16	OM	OM	OM	OM	OM or Supv.	OM	OM or Supv.	OM	Safety	OM	OM	Personnel	OM
Mail original CA-1 to OWCP	OM	Personnel	Personnel	OM	Safety	OM	Personnel	Safety	Safety	Safety	Safety	Personnel	OM
Mail CA-16 from outside M.D. to OWCP	OM	Private M.D.	Private M.D.	OM	Private M.D.	OM	Personnel	Private M.D.	?	Private M.D.	Private M.D.	Private M.D.	OM
Controvert COP for NASA	OM	OM	Personnel	OM	Supv.	OM	OM or Personnel	OM or Supv. & Safety	?	Safety	Supv	Personnel	OM
Notify payroll of COP	Supv.	Supv.	Personnel	OM	Supv.	OM	OM	Safety	?	Safety	Supv	Personnel	OM
Report quarterly COP usage to HQS	Personnel	Personnel	Personnel	Personnel	Safety	OM	Personnel	Payroll	N/A	N/A	Personnel	Safety report to JSC Safety	Payroll
Review monthly claim printout from OWCP	Safety	Safety	Safety	OM	Safety	OM	Safety	Safety	N/A	N/A	Safety	N/A	OM

* Zero claims in last year
OM — Occupational Medicine

Courtesy of Carolyn Snow, National Aeronautics and Space Administration

from one another in the particular formats for these records and reports. For example, at ARC, the nurses in the Health Unit keep a log of all occupational injuries and illnesses. In addition, they complete the NASA Form 1375A, Occupational Medicine Statistical Report for Occupational Injury and Illness, for each injury. This form is being used by all of the Centers. The 1375A codes for computer input data about the employee, the injury, and the treatment received. Currently, this information is not being entered into a computer. At ARC, it is stored for future reference in the Health Unit, and one copy is sent to the Chief of the Occupational Medicine Program. All of the Centers send the 1375A to Headquarters.

At JSC, the Occupational Medicine Program prepares several records and internal reports when job-related injuries occur. Every visit to the Health Unit is logged on an individual's Chronological Record of Medical Care (SF600). The Occupational Medicine Program also prepares the NASA Form 1497 (Attachment to CA-1&2 in Lieu of OSHA Form 101F), a Calendar for COP, the NASA Form 1375A, a Record of Injury (JSC Form 340), a daily log of occupational injuries and illnesses, and a NASA-JSC Dispensary Patient Data Report (JSC Form 544). The NASA Form 1497 is sent to OWCP. The Calendar for COP is sent to the Offices of Personnel, Payroll, and Safety. The NASA Form 1357A is sent to the Occupational Medicine Program at Headquarters. The Record of Injury (JSC Form 340) is sent to the Safety Program and to the injured employee's supervisor. The daily log is kept in the Health Unit, and the Dispensary Patient Data Report (JSC Form 544) is sent to Data Processing where the data are keypunched for computer input. Copies of all of these forms are maintained in the Occupational Medicine Program. In addition to these records and reports for each injury, quarterly summaries of the injured employees, the dates of their lost time, and the hours of lost time are sent to the Safety and Payroll Offices.

DFRC, GSFC, and KSC, the other Centers surveyed, have developed their own procedures for recording occupational injuries. In all instances, these procedures involve records for the Occupational Medicine Program and reports for Safety, Personnel, and other NASA offices.

Physical Examinations

All of the NASA Centers provide physical examinations for their employees. As a result, extensive scheduling and medical records are maintained at the Centers. Two types of physical

examinations are given, voluntary annual and job-related examinations. Annual examinations, either complete or partial, are offered to each NASA employee. Job-related examinations are required for employees with hazardous duties and for those exposed to substances for which OSHA standards exist.

The content of the annual physical examination records for each employee is similar from one Center to the next. Only the formats of the records differ. The typical medical file contains the following basic information:

1. Original medical history
2. Interval histories
3. Chronological visit summary
4. Medical examination reports
5. Physician's diagnoses and notes
6. Laboratory test results
7. Pulmonary function test records
8. Electrocardiograph reports
9. X-rays and X-ray reports
10. Audiogram records
11. Records of occupational injuries and illnesses
12. Immunization records
13. Vision test results.

Most of the above records are added to an employee's file annually. As a result, the medical files can be quite large for employees who have worked at NASA for longer than two or three years.

The Occupational Medicine Programs must also keep extensive records on job-related physical examinations. Not only must all medical records be maintained, but also there must be some way to assure that necessary examinations are scheduled and performed. For example, at JSC there is a new procedure for job-related examination reporting to verify participation. Examinations are requested

by the Safety Representative, approved by the Technical Manager, and scheduled by the Medical Records Supervisor. The Health Unit nurses receive daily lists of the types of examinations scheduled. They record the following information on a monthly log: contractor, type of examination, employee's name, date, complete or incomplete, qualified or unqualified for duty, or did not keep appointment. Every month, a list of the employees examined and the types of examinations is sent to each Safety Representative for verification and rescheduling, if necessary.

Health Unit Visit Records

In addition to treating occupational injuries and illnesses and the physical examination program, the Health Units provide other services. These services include employee assistance counseling, nutrition consultations, blood pressure readings, immunizations, and care for minor illnesses. Written records are kept on all visits to the Health Units. At most Centers, the nurses maintain daily logs of visits and types. In addition, records of visits are kept in employees' medical files.

Reports to the Headquarters Occupational Medicine Program

Each Center Occupational Medicine Program is required to regularly submit information on the health program activities, budgets, and personnel to Headquarters. This information is used in the preparation of annual internal and external reports and for management of the NASA-wide program. For example, the annual report to the CSC is compiled from this information. The Centers must also respond to an annual occupational medicine survey from Headquarters. The information requested in this survey includes general information, information on participation in the program, phasing and resources impact, manpower and cost, and special programs. At Headquarters, this information is compiled for all Centers and redistributed to the Occupational Medicine Program Directors.

Drug Enforcement Administration

The DEA requires that medical clinics maintain inventories and file reports concerning the supplies of controlled drugs which are maintained. These requirements are detailed in the section of this report on the Occupational Medicine Program at Headquarters. Basically, the Center Health Units must maintain running inventories of all controlled drugs and report losses and disposals.

Contractor Reports

All of the Center Occupational Medicine Offices surveyed have contractor employees staffing the Health Units. These contractors submit monthly reports to the Occupational Medicine Program Directors. The reports include productivity data, that is, counts of the numbers of services provided. These reports are used in the Occupational Medicine Program for contractor evaluations and program-related recordkeeping.

Productivity and Cost Reports

All of the Occupational Medicine Offices are required to submit annual productivity reports to the NASA Office of Institutional Management and cost reports to the NASA Office of Financial Management. These reports are described in the section of this report on the Occupational Medicine Program at Headquarters.

Miscellaneous Records and Reports

All of the Center Occupational Medicine Offices have reporting and recordkeeping requirements outside of the major requirements which have been described. For example, some of the programs prepare the Physician's Statement for Disability Retirement (SF2801-B) for the CSC. The Health Units are frequently called upon to prepare return to work authorizations for employees who have been on sick or disability leave. Physical limitations reports are prepared for employees who cannot participate in certain physical activities. The Health Units must maintain consent forms to show that employees approved the transfer of medical records from NASA to private physicians or other employers. Records are kept on training (e.g., CPR training). These and other reports add to the information requirements of the Occupational Medicine Program.

Overlapping Requirements

Occupational Injuries and Illnesses

The information requirements of the Safety, Environmental Health, and Occupational Medicine Programs all include reports and records on occupational injuries and illnesses. In addition, at some Centers, the Personnel and Payroll Offices have requirements for information on injuries and

illnesses. Each of the NASA Centers has developed procedures for filing workers' compensation claims with OWCP, managing resultant lost time (COP and compensation), and processing internal reports and records. There is little uniformity between the Centers in these procedures. At JSC, where the Occupational Medicine Program has been designated the interface with OWCP, the procedures for handling and documenting claims are centralized and well-organized, though somewhat cumbersome. On the other hand, at KSC, where the Safety Program processes the workers' compensation claims, the procedures for handling claims are barely adequate.

The report forms for OWCP are standard. However, each Center has unique procedures for processing these forms. The responsible offices are Occupational Medicine, Safety, Personnel, or some combination of these.

At all of the Centers surveyed, the Occupational Medicine and Safety Programs keep independent records of occupational injuries. Although these records are maintained separately, the information on them overlaps substantially. Also, both of these programs require data on COP and compensation which result from injuries. Thus, at Centers where the Occupational Medicine, Safety, and Personnel Programs all have information requirements concerning occupational injuries, there is considerable duplication in the data which are recorded.

Occupational Exposures

The Occupational Medicine and Environmental Health Programs have similar requirements for monitoring occupational effects on the health of NASA employees. These requirements are particularly interrelated with respect to exposures and medical monitoring. The Occupational Medicine Program needs information from Environmental Health on the substances and hazards to which individual employees are exposed. The Environmental Health Program needs notification from Occupational Medicine when occupational illnesses are suspected. The programs must also work together on occupational histories, emergency plans and treatments, health education, medical records retention, and protective devices for employees. As a result, many of the information requirements of the Occupational Medicine and Environmental Health Programs are interdependent. Procedures must be devised to correlate exposure and medical data.

Unique Center Requirements

Astronaut Medical Records

The Occupational Medicine Program at JSC maintains medical records for the astronauts and their families. These include extensive medical history and examination records for the astronauts. With the recent addition to the program of 35 new pilot astronauts and mission specialists, the recordkeeping burden for the program has increased.

Experimentation with Human Subjects

At ARC, the Occupational Medicine Program maintains all records concerning the health and protection of human research subjects. These records include research protocols, consent forms, and the physical examination records for subjects. The Occupational Medicine and Life Sciences Programs cooperate in maintaining these records.

Aviation Safety

Three of the Centers surveyed (ARC, DFRC, and JSC) have Aviation Safety Programs. These programs have information reporting and recordkeeping requirements for accidents, near misses, and maintenance activities. The procedures for reporting serious mishaps are similar at ARC, DFRC, and JSC. However, other reporting and recordkeeping procedures differ from one Center to the next.

Mission Support Activities

The Safety, Environmental Health, and Occupational Medicine Programs participate in mission support activities. This is especially true at KSC. As a result, there are recordkeeping requirements for these activities. These involve safety and industrial hygiene inspections and medical support for crew members.

Major Problems with the Current System

Because of the diversity of the Center reporting and recordkeeping procedures, problems with the procedures are perceived differently both within programs and between Centers. However, there

are several problems which seem common to most of the Centers surveyed. These are discussed in this section.

Occupational Injury and Illness Reporting

The reporting and recordkeeping of occupational injuries and illnesses involve the Safety, Environmental Health, and Occupational Medicine Programs. Because all three programs have information requirements concerning occupational injuries and illnesses, there is a considerable amount of duplication in their efforts to comply with Department of Labor Regulations, manage the programs within the Centers, and report statistics to Headquarters. As a result, the most frequently voiced complaints about the reporting and recordkeeping procedures are:

1. There are too many different forms to complete for occupational injuries and illnesses. The information on these forms is redundant.
2. Statistics on occupational injuries and illnesses, especially those on lost time, are inaccurate.
3. There is no way to coordinate and control COP.
4. The manpower and costs involved in administering the program are increasing.
5. The forms which are currently used for reporting and recordkeeping do not contain all of the necessary information for safety investigations.

These are serious problems with the system for managing the occupational injury and illness programs. It appears that only centralization of reporting and management responsibilities and changes in internal reporting forms will alleviate these problems.

Medical Monitoring of Employees

In order to effectively monitor the health of employees, the Occupational Medicine Program must have accurate and timely information on the duties the employees perform and any hazards to which they are exposed. That information must come from the Environmental Health and Safety Programs. Unfortunately, at most of the Centers, the only information provided to the Health Unit physicians comes from the employees themselves. Survey data are generally not made available to the Health Unit physicians. Complete occupational histories are not available. If the data were available, the current format would be cumbersome and time consuming to review. In addition, the

current surveys do not include complete chemical inventories, lists of all employees working with those chemicals, and exposure levels. With the increasing number of OSHA standards, this information problem is becoming more and more critical.

Headquarters Requests for Information

The Safety, Environmental Health, and Occupational Medicine Programs at Headquarters have frequent requirements for information from the Centers. These information requirements span the activities of the programs. For example, the Safety Program frequently needs information on accidents and injuries. The Environmental Health Program needs survey information on workplace hazards. The Occupational Medicine Program needs diagnostic information from physical examinations. All three programs need budget, manpower, and program activity information. When each special request for information is made, personnel from the Centers must delay their own projects to compile the data requested. Without an automated information system for use by both the Centers and Headquarters, this problem will continue. The need for a consolidated information system is discussed in the next section of this report.

REQUIREMENTS FOR A CONSOLIDATED INFORMATION SYSTEM

A review of the information requirements of the Safety, Environmental Health, and Occupational Medicine Programs has shown a need for a computerized safety and health information system. That need is based upon the volume of the information generated by these programs, deficiencies in the current methods for processing and storing this information, the amount of personnel time associated with the current systems, the excessive amount of personnel time required to comply with OSHA standards and regulations, management needs, and legal and regulatory requirements. These factors which justify the development of a computerized information system are discussed in this section.

Interactions Between the Safety, Environmental Health, and Occupational Medicine Programs

The review of the reporting and recordkeeping requirements of the Safety, Environmental Health, and Occupational Medicine Programs has shown interdependent information needs at Headquarters and the Centers. Because the information requirements of the safety and health programs are so closely related, there is considerable duplication in the data used to generate reports.

Consider the duplication involved with accident and injury statistics. The Safety Program has external and internal reporting requirements which mandate the collection of data on all accidents and injuries. The Safety Program must also use the information on accidents and injuries to develop accident countermeasures. The Occupational Medicine Program provides treatment and referral for job-related injuries. As a result, the Occupational Medicine Program also has external and internal reporting requirements involving accident and injury data. In most instances, the Safety and Occupational Medicine Programs are working with the same information about accidents and injuries. However, each program has its own procedures for generating report data and storing information. This duplication is compounded by the fact that the Personnel and Payroll Offices also have similar information requirements associated with occupational injuries.

The external reports for which accident and injury data are necessary are: 1) the annual report to OSHA, 2) the 102F and 102FF annual summaries for OSHA, 3) Type A accident reports to the Secretary of Labor, 4) the annual report on Federal Fire Losses for NFPCA, 5) all workers' compensation forms for OWCP, 6) the CSC report on Occupational Health Services, and 7) a quarterly report for OWCP on COP (prepared by the Personnel Office at Headquarters). Internal reports which require inputs on accidents and injuries include: 1) the annual NASA mishap report, 2) the 100F log for OSHA, 3) internal notifications of injury, 4) safety investigation reports, 5) contractor reports, and 6) productivity reports. The Safety, Environmental Health, and Occupational Medicine Programs share the responsibility for these reports. In most instances, an exchange of information from Centers to Headquarters is involved. A central data system that could be used and accessed by all who need accident and injury information would facilitate the generation of statistics for reports, simplify the duplication of recordkeeping requirements, and, thus, save personnel time.

Accident and injury statistics are only one area in which Safety, Environmental Health, and Occupational Medicine information requirements overlap. A second important area is associated with industrial hygiene monitoring and medical surveillance. The health surveillance of employees is required by OSHA and dictated by moral, legal, and economic factors. The Environmental Health and Occupational Medicine Programs must work together to achieve effective surveillance. Their record systems are critically important for this effort. Computerization of these records is essential for correlation of workplace survey data and medical records, scheduling of job-related physical examinations, required record retention, program evaluation, and epidemiological studies. Other, previously discussed information areas common to the safety and health programs include occupational illness records, environmental and safety survey records, records on the use of personal protective equipment, and training and certification records.

The duplications in health and safety information requirements have been realized by both Government and industry. Computerized information systems which serve the information needs of health and safety programs have been developed by the U.S. Department of Agriculture, the Los Alamos Scientific Laboratory, and the Standard Oil Company of Indiana (Amoco), to name a

few. These employers recognized both the need and economic justifications for combined health and safety information systems. NASA should also recognize the benefits which would result from the development of a combined system.

Volume of Information

The growing volume of the reporting and recordkeeping requirements of the Safety, Environmental Health, and Occupational Medicine Programs necessitates the development of a computerized information system. The requirements have already reached a point at which NASA cannot comply with all of the OSHA regulations and recommendations for recordkeeping without either a large increase in safety and health personnel or computerization of records. Data processing techniques can enhance the handling of safety and health records by facilitating the storage and retrieval of information, the generation of reports required by Government regulations, the identification and scheduling of individuals for health examinations, and the correlation of safety and health data for epidemiological and management purposes (Hoskin, 1977).

This review of NASA's safety and health information requirements documents the large reporting and recordkeeping burden associated with particular areas of the programs. Currently, the largest information requirements are associated with accident and injury statistics, medical monitoring, and workplace monitoring, including inventories of hazardous substances. Because of the volume of information which must be available, none of these areas are adequately documented by the current records systems.

There are several major problems with the scope of the reporting and recordkeeping systems for accidents and injuries. These problems were addressed in previous sections of this report. For convenience, they are all listed here.

1. Most of the current forms for documenting occupational injuries do not include adequate accident characteristics data.
2. Data on accidents and injuries are generated by several offices. Current procedures for sharing these data have increased paperwork.
3. The statistics on injuries and resultant lost time which are generated by different offices do not always correspond. This is especially true for data on COP.

4. Delays are involved in the exchange of information between the Centers and Headquarters. These problems could be solved by reformatting internal accident and injury report forms, and establishing a centralized, computerized information system for accidents and injuries.

A second area in which the information volume necessitates a change in the current system of records involves the medical files maintained by the Occupational Medicine Program. These files include data from voluntary and job-related physical examinations. The following is a list of the major problems associated with the volume of the medical surveillance records.

1. The number of medical files for NASA employees and contractor employees is large.
2. Within these files, there are data from many examination components (audiograms, laboratory tests, diagnoses, etc.). Thus, individual files may be quite large, and their review is time consuming.
3. The OSHA standards require and the NIOSH criteria documents recommend job-related physical examinations which differ for different occupational exposures. The current system for scheduling and conducting examinations does not comply with all of these recommendations and requirements.
4. There is currently no formal mechanism for correlating medical records with employee exposure records from industrial hygiene and safety surveys.
5. There are requirements for the retention of some medical records for at least 40 years.
6. The current records system does not permit epidemiological analysis of data from physical examinations.

Since the medical monitoring requirements imposed by OSHA (and soon the CSC) are growing, these current problems with maintaining medical records and monitoring the health of employees will increase. The development of a flexible computerized information system to schedule examinations, maintain records, correlate medical and environmental data, and conduct analyses will be the most efficient and economical method for reducing these problems.

The growing requirements for computerizing occupational medicine records have been recognized by industries in which environmental hazards exist. Some companies have developed or are developing computerized systems. For example, the North Carolina Works of Western Electric Company, Inc. is developing a computerized system to identify employees with common

occupational exposures, schedule physical examinations and training, maintain medical records, generate medical history and exposure profiles on employees, and conduct statistical comparisons between exposed and nonexposed populations (Barrett and Belk, 1977). A recent survey of 230 corporate medical directors showed that 74% of the 163 respondents were planning or considering more extensive medical information systems (Forbes, Dunn, Hillman, Hipp, McDonagh, Pell, and Reichwein, 1977). Clearly, computerized medical information systems are becoming a necessity for large organizations.

The third area of information in which the volume of the current requirements exceeds the capabilities of the existing recordkeeping systems involves environmental health and safety inspection and survey information. The review of these survey requirements in previous sections of this report indicated the magnitude of the recordkeeping requirements associated with workplace monitoring. The problems associated with the volume of these records follow.

1. There are many current requirements for workplace monitoring (radiation, chemical exposures, air and water pollution, etc.).
2. There are many records generated by this monitoring.
3. The NIOSH criteria documents recommend monitoring which is not currently conducted.
4. The requirements for workplace monitoring and recordkeeping are growing.
5. There is currently no formal mechanism for correlating workplace monitoring and exposure records with medical records and accident histories.
6. A complete inventory of all hazardous substances stored and used at NASA is not available.

It is absolutely essential that workplace exposures be documented and correlated with medical surveillance data. Establishment of a computerized information system would facilitate NASA compliance with OSHA regulations and enhance NASA's programs for protecting the health of its employees.

Deficiencies in the Current Methods for Processing Information

The current procedures for processing information between the Safety, Environmental Health, Occupational Medicine, and Personnel Offices and between the Centers and Headquarters are inefficient and time consuming. This is partially due to the duplication in reporting and recordkeeping requirements. When staff members must copy and recopy the same information onto forms for different programs, much of their time is wasted.

Accident and injury reports are the best example of this duplicative reporting. When an injury occurs at JSC, it is usually reported to the Occupational Medicine Program. There, at least nine forms (including two for OWCP) are completed. Copies of all forms remain in the Occupational Medicine files. Other copies are sent to OWCP and four NASA offices. One of these offices is the Safety Program. In Safety, another file is maintained on the injury. At least three more forms are completed in addition to the forms sent by the Occupational Medicine Program. Both Safety and Occupational Medicine use the data from the injury records to prepare a combination of at least five summary reports. This is not to say that the JSC injury reporting system is disorganized. It is well-planned to provide all offices with the information which is required for their reports and records. However cumbersome, it is necessary in the absence of a combined, automated system.

The development of a computerized information system, designed for use by all who require accident and injury data, would increase the efficiency of the reporting and recordkeeping systems of its users. Duplication in internal reporting and recordkeeping would be eliminated. The time spent in preparing original and summary reports at the Centers would be reduced significantly. In addition, the procedures for the transfer of information to Headquarters and the preparation of summary reports at Headquarters would also become more efficient.

Another problem with the procedures for processing information involves communication between the Centers and Headquarters. As previously mentioned, the Safety, Environmental Health, and Occupational Medicine Programs all require information from the Center programs. Some of this information is submitted regularly. However, there is no formal mechanism for the transfer of all of the information needed at Headquarters. As a result, the programs at Headquarters must make

frequent special requests for information. That is a problem for Headquarters because there can be long delays before the information is submitted. Much of the information needed to evaluate programs is never requested because it is not readily available. For the Centers, the problem exists in reassigning staff members to generate or compile the information requested. For example, each time the Environmental Health Program at Headquarters requests inventory data on a particular chemical, a Center professional must conduct a survey and write a report. The time spent in doing this can be particularly critical at Centers where reductions in force have created personnel shortages in the safety and health programs. If survey and inventory data were entered into a computer as they were collected, the data would be available for use by both the Centers and Headquarters. Survey data are only one example. Other types of information which should be immediately accessible at Headquarters include training, productivity, budget, and manpower data. There is currently no formal mechanism for the transfer of this information from the Center Safety Programs to Headquarters.

Personnel Time Associated With the Current System

In order to assess the personnel time savings which would result from institution of a computerized information system for the Safety, Environmental Health, and Occupational Medicine Programs, the time associated with the current reporting and recordkeeping systems was surveyed at Headquarters. In all three programs, reporting, recordkeeping, and review and summary tasks were found in which personnel time could be reduced by a computerized system. Keep in mind the fact that the current system of records is inadequate for efficient compliance with current Federal regulations. If the personnel times associated with the currently required records systems were considered, the time savings by a computerized system would be on the order of several man-years at Headquarters alone.

In the Safety Program at Headquarters, the principal time savings in current activities would be realized during the preparation of summary reports. The preparation of NASA's annual report to OSHA takes a safety professional three weeks per year. The preparation of the annual *NASA Mishap and Injury Data* report consumes an additional four weeks per year. The major tasks involved in the preparation of these reports are compilation of the data and computation of

summary statistics. It is estimated that a computerized information system would reduce the professional time required in the preparation of these reports by at least two-thirds. That would free four weeks of professional time for other safety activities.

It is estimated that the preparation of other reports and the review of Center statistics take about four weeks per year of professional time. A computer system could eliminate half of that time by automated retrieval and computation of summary statistics.

In the Environmental Health Program at Headquarters, the time savings from a computerized information system would result more from an increase in the accessibility of Center data and compliance with regulations than from a decrease in report preparation time. This is due to the fact that most reports are prepared at the Centers. About four weeks per year are currently spent in consolidating and reviewing data which have been requested from the Centers. If these data were on a computer data base accessible at Headquarters, this time could be reduced by one-half. A two-week savings is especially significant in light of the growing requirements in the environmental health field.

The Occupational Medicine Program at Headquarters has a full-time Records Technician for maintaining medical records and coordinating OWCP reports. It is estimated that an automated information system would save none of her time because OWCP requirements for information cannot be changed. However, current requirements actually dictate the addition of Records Technicians for compliance. Since staff member additions are impossible, a computerized records system must be developed. The time savings for the Health Unit physician and other professionals in the Occupational Medicine Program (whose time is considerably more expensive) would be significant. A computerized medical information system could assimilate and summarize medical data for the physician. That time savings in records review could free the physician to spend more time with the patient-employees. Other professionals in the Occupational Medicine Program would realize savings in time because of the elimination of time spent in compiling and summarizing data from the Centers. It is estimated that three man-weeks per year of current activities could be saved in this manner.

It is expected that the savings in personnel time at the Centers would far exceed the savings at Headquarters. This is because Center programs are larger and encompass greater information requirements. These time savings would result from elimination of much of the duplication in reporting and recordkeeping within the Centers and between the Centers and Headquarters.

Legal and Regulatory Requirements

The Williams-Steiger Occupational Safety and Health Act of 1970 (P.L. 91-596 amended by P.L. 93-237) was passed by Congress to assure safe and healthful working conditions for employees. Section 10 of the Act directed Federal agency directors to establish comprehensive occupational safety and health programs. Section 24 of the Act directed the Secretary of Labor to *develop and maintain an effective program of collection, compilation, and analysis of occupational safety and health statistics.*

In 1971, Executive Order 11612 directed Federal agencies in their compliance with the Act. Reporting and recordkeeping guidelines were published. In 1974, Executive Order 11807 was issued to guide agency heads in directing their occupational safety and health programs. The order directed Federal agency directors to:

1. Appoint an agency official to manage and administer the agency occupational safety and health program.
2. Establish an occupational safety and health management information system to maintain records on accidents, injuries, illnesses, and their causes, and to compile data for reports on this information.
3. Adopt safety and health standards consistent with those issued by OSHA.
4. Provide adequate safety and health training for managers, supervisors, and employees.
5. Submit an annual safety and health report to the Secretary of Labor.
6. Cooperate with the Secretary of Labor in his duties.

The Executive Order was intended to make Federal agencies a model for compliance with the Act. The Department of Labor published regulations of Federal agency safety and health programs in 1974 (CFR, Title 29, Chapter XVII, Part 1960) and amended them in 1974, 1975, and 1977.

These regulations established reporting and recordkeeping requirements for occupational injuries, illnesses, and accidents. They also required agencies to adopt medical and workplace monitoring requirements similar to OSHA's. Agencies were directed to establish management information systems to collect and use information, identify unsafe or unhealthful working conditions, and establish program priorities. *Recordkeeping and Reporting Guidelines for Federal Agencies* were recently (January 1, 1978) reissued by the Department of Labor.

The Department of Labor has also published regulations concerning the Federal Employees' Compensation Act, or FECA (5 U.S.C. 8101 *et seq.*). These regulations include reporting and recordkeeping requirements for all FECA programs.

Federal agencies have been slow to comply with the provisions of the Occupational Safety and Health Act. In 1976, the General Accounting Office (GAO) prepared a report to Congress by the Comptroller General on *Hazardous Working Conditions in Seven Federal Agencies*. Inspections of these agencies found 14,000 conditions that did not meet OSHA standards. It was also discovered that Federal agencies were not keeping *adequate records on occupational deaths, injuries, and illnesses and their causes to help insure that workplace hazards that could cause deaths, injuries, and illnesses are identified and eliminated*. The GAO made eight recommendations for agencies. These included recommendations for the preparation of formal inspection reports and inclusion of inspection findings in the agency information systems. The GAO also recommended that the Secretary of Labor *coordinate with Federal agencies in establishing a single recordkeeping and reporting system to be followed by all Federal agencies so that accurate and consistent data on occupational deaths, injuries, illnesses, and their causes as well as findings on inspections of workplaces can be maintained. This information is essential in eliminating workplace hazards*. The Department of Labor agreed with the GAO findings and recommendations.

In 1976, the House of Representatives Committee on Government Operations released a report on *Safety in the Federal Workplace* (House Report No. 94-784). The Committee reported that implementation of the Occupational Safety and Health Act by Federal agencies was unsatisfactory. They also reported that agency information systems for accidents, injuries, and illnesses were inadequate because they did not *maximize knowledge of their causes* in the development of safety

and health programs. The Committee recommended an improved reporting and recordkeeping system for Federal agencies and greater analysis of data for program evaluation and improvement.

Recently, OSHA evaluated NASA's Safety and Environmental Health Programs. Their report was critical of NASA's accident reporting system because it has not been extended into a *true management information system*. According to OSHA, the information system should include input from inspection reports, hazard reports, abatement schedules, and training records in addition to data on occupational accidents, injuries, and illnesses. They recommended the establishment of a NASA-wide management information system which would include Center reports of accidents, hazard analyses, operations, inspection results, and abatement schedules.

It is clear that NASA has been directed to develop a comprehensive information system for safety and health. While OSHA's authority to direct NASA to develop a particular type of system is questionable, the Executive Order does require the establishment of a comprehensive information system for safety and health. In addition, Federal agencies have been criticized by GAO and the Congress for their failure to develop safety and health information systems. Thus, in addition to a real need for a more complete information system, NASA has a legal and administrative responsibility to establish one.

RECOMMENDATIONS FOR A COMPUTERIZED INFORMATION SYSTEM FOR SAFETY, ENVIRONMENTAL HEALTH, AND OCCUPATIONAL MEDICINE

The information requirements of the Safety, Environmental Health, and Occupational Medicine Programs have exceeded the capabilities of the current reporting and recordkeeping systems. It will be necessary to redesign many components of these systems. The preceding section presented the need and justifications for the establishment of a computerized system for combined Safety, Environmental Health, and Occupational Medicine information requirements. Recommendations for the development and scope of that system follow.

General Recommendations

1. *Establish a computerized information system to serve the Safety, Environmental Health, and Occupational Medicine Programs.*

Rationale

The information requirements of the Safety, Environmental Health, and Occupational Medicine Programs have increased to such an extent that their reporting and recordkeeping systems are no longer adequate. Improved information systems should be developed for all three programs. Since the information requirements of the safety and health programs are interdependent, the development of a computerized information system to serve Safety, Environmental Health, and Occupational Medicine appears to be the most efficient and economical way to improve these information systems.

The Safety, Environmental Health, and Occupational Medicine Programs have interdependent reporting and recordkeeping requirements for the following program areas: accidents, occupational injuries and illnesses, workplace monitoring, and medical surveillance of employees. In the cases of accidents and occupational injuries and illnesses, each program is keeping separate and duplicative records and preparing summary statistics and reports with these records. These activities consume personnel time which should be used for other program activities. In the areas of workplace monitoring and medical surveillance, the safety and health programs must coordinate their records systems to allow immediate identification of potential hazards in the workplace, identification of

employees exposed to those hazards, and efficient medical surveillance of those employees. Coordination of these activities is impossible without an improved, combined information system for the programs involved

The increasing volume of the reporting and recordkeeping requirements of the Safety, Environmental Health, and Occupational Medicine Programs necessitates the development of a computerized information system. NASA cannot comply with the current and expected OSHA requirements without either a large increase in safety and health personnel or computerization of records. The development of a computerized information system is probably the only one of those options which is economically feasible.

A combined, computerized information system for safety and health would allow these programs to eliminate duplication in recordkeeping, automatically retrieve summary statistics for internal and external reports, monitor trends in the workplace and the health of NASA employees, efficiently comply with OSHA requirements and recommendations, and access the data base for epidemiological studies.

2. Develop a system which will serve the needs of NASA Centers and Headquarters.

Rationale

The NASA Centers and Headquarters have many of the same information requirements. These similar requirements could be merged into a common NASA-wide information system. The system would replace individual information systems at the Centers and the NASA-wide system between the Centers and Headquarters.

Currently, the Centers surveyed share with Headquarters many of the same problems with safety and health reporting and recordkeeping requirements. Decreasing staff sizes and increasing information requirements have made the use of manual information systems inefficient and time consuming. A computerized information system would eliminate duplications in recordkeeping, allow quick preparation of summary reports, and permit efficient compliance with regulatory agency requirements at the Centers. In addition, the time spent at the Centers in preparing reports

for Headquarters would be minimized because Headquarters would have direct access to the records needed. A NASA-wide information system for safety and health would also provide for comparability of records among the Centers.

- 3. *Provide computer terminals for all users to ensure convenient access to the system.*

Rationale

Only a convenient system will be accepted and fully utilized by the Centers. Complete utilization is essential for an independent information system. If some Centers use the system, and others do not, it will be impossible to use the data base to compute NASA-wide summary statistics or to transfer management information from all of the Centers to Headquarters.

The Centers must have immediate access to their records in the system. To ensure this, all Centers must have terminals for input and output of records. A system designed solely to satisfy the information requirements at Headquarters would be unacceptable because it would add to the information burden at the Centers. However, a system designed for use at the Centers could also be used to provide information to Headquarters.

4. *Ensure that the system is not an add-on system. This will require revision of the internal reporting and recordkeeping procedures and forms to eliminate duplication with the system.*

Rationale

One of the purposes of the computerized information system will be to eliminate the duplication in internal reporting and recordkeeping requirements. This goal can be implemented by replacing the duplicative reports and records with one system of inputs and outputs. The use of mark-sense report forms or terminal templates might be appropriate for the new system. Carefully designed mark-sense input forms could serve as both written records and computer inputs. On the other hand, the use of terminal templates could eliminate the need for many written records.

Information would be entered into the computer where it is received. It would then be available to all who need it and are authorized to use it. The large number of written reports which currently

circulate between the Offices of Safety and Environmental Health, Occupational Medicine, and Personnel and between the Centers and Headquarters would be eliminated. As an example, the computer system would have one record of each occupational injury. That record would receive input from as many as four offices and would be used by all four offices. That one record would replace between six and ten (depending on the Center) internal written records of the injury. Currently used internal injury reporting and recordkeeping forms would be eliminated.

5. *Design a flexible system to accommodate changes in regulations and the addition of recordkeeping requirements.*

Rationale

Changes in reporting and recordkeeping requirements will occur. New OSHA recordkeeping requirements are expected to be imposed by new health standards. New laboratory or diagnostic tests will be added to the physical examinations. Other needs will change. Modifications to a flexible system will be more economical than continuous replacement of outdated systems.

The software should be designed to accommodate special entries in each file. These entries could be coded as such and entered into a special field designed for them. The software should be flexible enough to allow changes in the number of records or files which can be stored or printed out without extensive reprogramming. The software should also be designed to make all of the data base accessible for statistical routines which are not currently planned, but may be required in the future. A batch query capability could be used for this purpose.

Recommendations for System Elements

The proposed computerized information system for the Safety, Environmental Health, and Occupational Medicine Programs would have five major components. Each of these components would receive inputs from two or more NASA programs. Figure 2 shows the five system components and the elements in each. The shaded boxes indicate elements which would receive inputs from more than one program (e.g., Environmental Health and Occupational Medicine). The white boxes indicate elements which would probably receive input from just one program. A quick

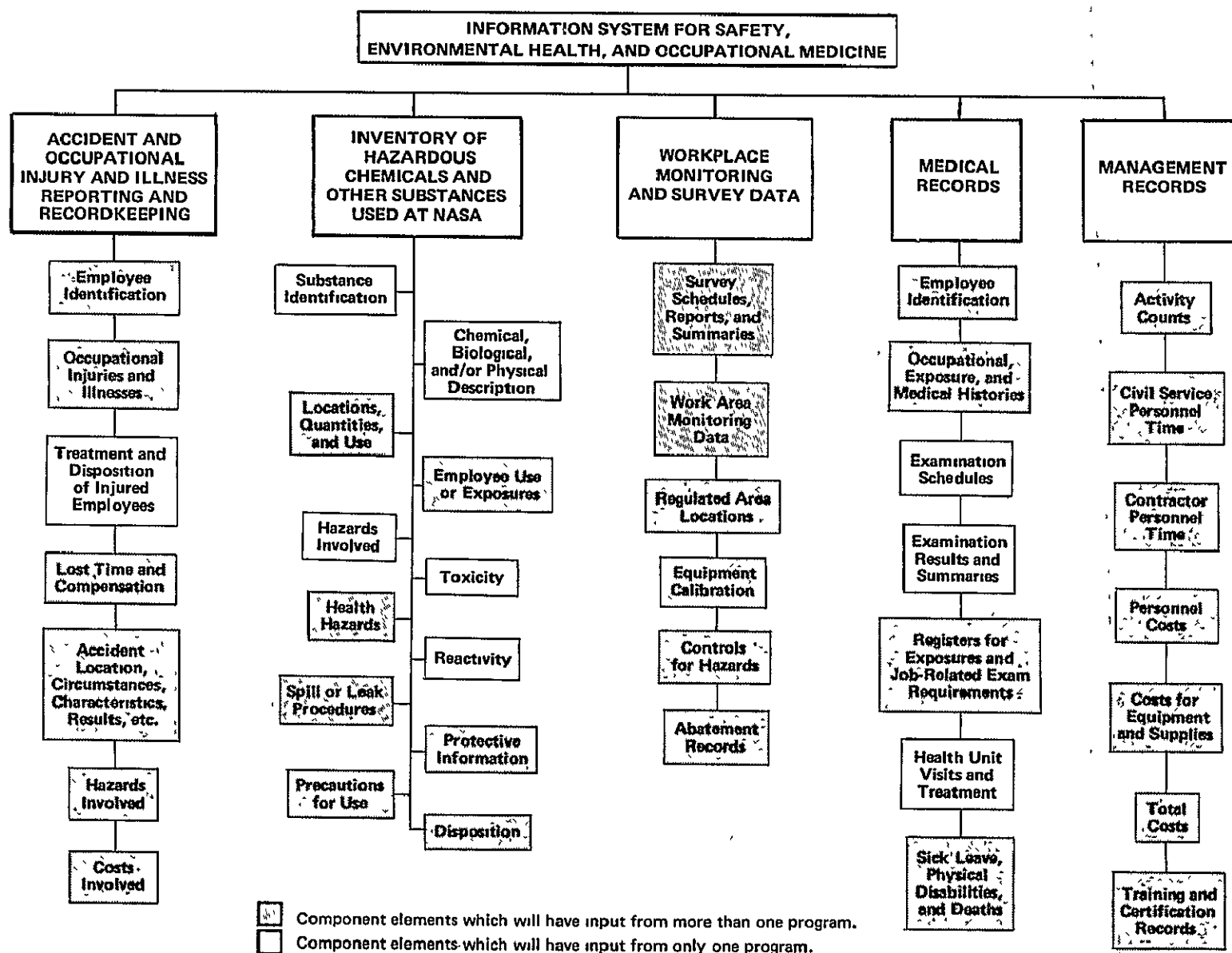


Figure 2. Component elements for a combined information system for Safety, Environmental Health, and Occupational Medicine.

glance at the chart should show the large number of program areas in which the information requirements of the Safety, Environmental Health, and Occupational Medicine Programs are interrelated. Recommendations for the scope of each component follow.

1. *Establish a system component for accident and occupational injury and illness reporting and recordkeeping.*

Rationale

The system will eliminate the myriad of internal reports, notifications, and records on accidents, injuries, and illnesses kept by the Safety, Environmental Health, Occupational Medicine, and Personnel Programs. Data on accidents, injuries, and illnesses would be entered into the system at the office in which they are reported. These data would be used and possibly expanded by other offices. Summary reports for all users would be generated by the computer. It is anticipated that a significant savings in personnel time would result from the establishment of this component.

This component will also satisfy Federal requirements for an accident and injury information system. These requirements were imposed upon Federal agencies by Executive Order 11807 and by OSHA regulations for Federal agencies (CFR, Title 29, Part 1960). Another benefit from the establishment of this component will be a central system of records for injuries, lost time, COP, and compensation. The study and management of the workers' compensation programs are priorities for the Safety and Occupational Medicine Programs.

Component Elements

The component will store and report on the following accident, injury, and illness data:

Employee identification

Occupational injuries and illnesses

Treatment and disposition of injured employees

Lost time and compensation

Accident location, circumstances, characteristics, results, etc.

Hazards involved

Costs involved.

2. *Establish a component to inventory the toxic chemicals and other hazardous substances used at NASA.*

Rationale

There are current requirements for inventory information. A manual information system cannot accommodate the volume of the inventory data which are required or the constantly changing status of these data. The inventory component in the system will satisfy information requirements and permit correlation with medical and workplace surveillance records. In addition, the component will make Material Safety Data Sheets accessible at all of the Centers.

Currently, there are 19 full health standards. It is essential that NASA keep records on the regulated substances which are used at the Centers. There are about 400 additional toxic substances for which exposure limits have been established by OSHA. Many of these substances are used at NASA, and records should be kept on their quantities, exposures, and use. When OSHA releases full health standards for each of these substances (expected in 1978), inventory records will be required for each of them. There are at least 21,000 chemicals which have been identified by NIOSH as toxic, and there are an additional 80,000 chemicals for which some toxicity data are available. It is impossible for NASA to keep accurate and up-to-date inventory information on the use of even small numbers of the known toxic substances at all of the Centers without a computerized information system.

Inventories must also be kept for all radioisotopes used at the Centers. Some Centers have already designed computer systems to maintain these inventories. This system component will permit all of the Centers to maintain computerized inventories of radioisotopes.

This component will maintain records on employee exposure levels to hazardous substances. These records will be linked to the medical surveillance records to permit the earliest possible detection of harmful occupational effects on the health of employees.

Component Elements

The component will store and report inventory information on toxic chemicals, radioactive materials, and other hazardous substances. The following data would be included.

Substance identification

Chemical, biological, and/or physical description

Locations, quantities, and use

Employee use or exposures

Hazards involved (fire, explosion, etc.)

Toxicity

Health hazards

Reactivity

Spill or leak procedures

Protective information

Precautions for use

Disposition.

3. Establish a system component for workplace monitoring and survey data.

Rationale

A well-designed component for these monitoring data would satisfy existing requirements and anticipate forthcoming ones. In addition to the maintenance of safety and environmental health survey and inspection records, the component would be used to flag scheduled monitoring requirements and document compliance with regulations. The OSHA safety and health standards require periodic monitoring of certain work areas for potential hazards. It is NASA policy to periodically evaluate all work areas for hazards. The component would schedule monitoring and maintain inspection records for each of the Centers. In addition, correlations of work area

monitoring records and medical examination records would be permitted. The volume of paperwork associated with the current manual system precludes these comparisons.

Component Elements

This component will store and report information on safety and environmental health monitoring. The following information would be included:

Survey schedules, reports, and summaries

Work area monitoring data

Regulated area locations

Equipment calibration

Controls for hazards

Abatement records.

4. *Establish a system component for medical records. This component would include physical examination data, Health Unit visit data, occupational, exposure, and medical histories, and a mechanism for scheduling and managing medical surveillance.*

Rationale

Consolidation of these various medical records into one system component will allow efficient storage, retrieval, and analysis of data on employee health. OMIS, the current computerized medical information system at Headquarters, is inadequate. The health profile reports do not include all of the information generated by the physical examination program. This component will allow redevelopment of OMIS, integration of these records with other occupational medicine records, and extension of the system to all of the Centers.

Information from this component will be correlated with information in the inventory and workplace monitoring components to permit compliance with OSHA regulations. The OSHA health standards require a coordinated program of medical surveillance and recordkeeping. Compliance with the 19 standards currently in effect and the examinations recommended in the criteria

documents has taxed the recordkeeping capabilities of the Occupational Medicine Program. The addition of new requirements (expected with the adoption of 400 new health standards) will necessitate a new information system to schedule examinations and maintain examination records. This component will allow efficient compliance with these requirements.

With the current manual system, analyses of medical records are prohibitively time consuming because of the number of employee medical files and the number of records within each of them. Computerization of these records will provide an accessible data base for epidemiological analyses. In addition, audiometer, treadmill, and diagnostic information will be available for trend analyses.

This component will interface with the component for accident and injury statistics to maintain records on occupational injuries and illnesses. These records will be available for analyses of the lost time and COP associated with traumatic injuries.

All medical data are confidential, and the identities and confidential records of employees must be protected in this component.

Component Elements

The occupational medicine component will store and report on the following data

Employee identification

Occupational, exposure, and medical histories

Examination schedules

Examination results and summaries (includes audiograms, diagnoses, stress tests, etc.)

Registers for exposures and job-related examination requirements

Health Unit visits and treatments

Sick leave, physical disabilities, and deaths.

- 5 *Establish a component for management records. Include information on program activities, personnel, productivity, budgets, and training.*

Rationale

Safety, Environmental Health, and Occupational Medicine Program Directors at Headquarters and the Centers must have access to these data for program management, program evaluation, and policy making. This component will allow prompt and efficient access to this information. Currently, year-end special requests must be made to get most of this information. There is no system for the regular transmission from the Centers to Headquarters of information on productivity, costs, services, training, accomplishments, or problems. Special requests for this information increase the reporting burden at the Centers. A carefully designed management records component could serve the needs of the Safety, Environmental Health, and Occupational Medicine Directors at the Centers and also provide a mechanism for efficient transfer of necessary information to Headquarters.

Component Elements

The following management information would be stored and reported:

Activity counts (number of inspections conducted, physical examinations given, etc.)

Civil service personnel time

Contractor personnel time

Personnel costs

Costs for equipment and supplies

Total costs

Training and certifications.

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APPENDIX A

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FEDERAL OCCUPATIONAL INJURIES AND ILLNESSES SURVEY

Attention: Mr. Sanford Hamilton
OMDS-OSHA, Room N3507
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, D.C. 20210

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Report for the agency
identified to the right

GENERAL INSTRUCTIONS

This questionnaire contains forms OSHA No 102F, "Summary Report of Federal Occupational Injuries and Illnesses" and OSHA No 102FF, "Summary Report of Federal Occupational Property Damage Incidents" Both parts should be completed according to the detailed instructions on the following pages. The person completing this questionnaire should also enter the information requested below.

Refer to the booklet "Recordkeeping and Reporting Guidelines for Federal Agencies" for additional information concerning Federal Agency responsibilities under the Williams-Steiger Occupational Safety and Health Act of 1970.

Report prepared by.	Date
Title	Phone
Comments	

Please turn page and complete 102F and 102FF forms

SUMMARY REPORT OF FEDERAL OCCUPATIONAL INJURIES AND ILLNESSES

A This is the separate summary report for

A 1 Civilian Personnel - ☐

A 2 Military (Non combat) Personnel - ☐

B Report Period Ending Date

Month Day Year

INJURY AND ILLNESS CATEGORY		TOTAL CASES	DEATHS	LOST WORKDAY CASES				NONFATAL CASES WITHOUT LOST WORKDAYS	TERMINATIONS OR PERMANENT TRANSFERS
				Total Lost Workday Cases	Cases Involving Days Away From Work	Days Away From Work	Days of Restricted Work Activity		
CATEGORY	C O D E	Number of entries in Col 7 of the log (1)	Number of entries in Col 8 of the log (2)	Number of checks in Col 9 of the log (3)	Number of entries in Col 9A of the log (4)	Sum of entries in Col 9A of the log (5)	Sum of entries in Col 9B of the log (6)	Number of checks in Col 10 of the log (7)	Number of checks in Col 11 of the log (8)
OCCUPATIONAL INJURIES	10								
O C C U P A T I O N A L I L L N E S S E S	Occupational Skin Diseases or Disorders	21							
	Dust Diseases of the Lungs	22							
	Respiratory Conditions Due to Toxic Agents	23							
	Poisoning (Systemic Effects of Toxic Materials)	24							
	Disorders Due to Physical Agents	25							
	Disorders Associated With Repeated Trauma	26							
	All Other Occupational Illnesses	29							
TOTAL-OCCUPATIONAL ILLNESSES (Sum of codes 21 through code 29)	30								

TOTAL-OCCUPATIONAL INJURIES AND ILLNESSES (Sum of code 10 and code 30)	31								
--	----	--	--	--	--	--	--	--	--

Total Man hours worked by all employees	40										(This Reporting Period)
Average number of employees	50										(This Reporting Period)
Average work week for all employees	51	☐ Check this box only when average work week for all employees is (a) less than 30 hours or (b) more than 50 hours per week									

*Nonfatal Cases Without Lost Workdays-- Cases resulting in Medical treatment beyond first aid, diagnosis of occupational illness, loss of consciousness or transfer to another job (without lost workdays) -

INSTRUCTIONS FOR REPORT PREPARATION – FORM OSHA NO 102F

Insert a check-mark (✓) in the appropriate square box to identify data contained in the report as either civilian or military. Please do not combine civilian and military data - submit separate reports for each group.

Reporting Period Enter the last month and day of the current reporting quarter, along with the year, in the appropriate boxes. For example, 03 - 31 - 76 means the period January 1 - March 31, 1976.

INSTRUCTIONS for completing this form All entries must be summarized from the log (OSHA No 100F) or its equivalent. Before preparing this summary, review the log to be sure that entries are correct and each case is included in only one of the following classes: deaths (date in column 8), lost workday cases (check in column 9) or nonfatal cases without lost workdays (check in column 10). If an employee's loss of workdays is continuing at the time the annual summary is being made, estimate the number of future workdays he will lose and add that estimate to the workdays he has already lost and include this total in the annual summary. No further entries are to be made with respect to such cases in the next year's annual summary.

Occupational injuries and the seven categories of occupational illnesses are to be summarized separately. Identify each case by the code in column 7 of the log of occupational injuries and illnesses.

The Summary Form OSHA No 102F should be completed as follows:

- A. (Code 10) Occupational Injuries (identified by Code 10 in Column 7 of the OSHA No. 100F Log) Record the following on the line designated by Code 10 on the OSHA No 102F:
 - Column 1 Total injury cases Count the number of times Code 10 appears in Column 7 of the OSHA No 100F log. Enter the total of this count under Column 1 of the OSHA No 102F.
 - Column 2 Total deaths For all Code 10 entries, count the number of times a date appears in Column 8 of the OSHA No 100F Log. Enter the total of this count under Column 2 of the OSHA No 102F.
 - Column 3 Total Lost Workday Cases For all code 10 entries, count the number of times a check-mark (✓) appears in Column 9 of the OSHA No 100F Log. Enter the total of this count under Column 3 of the OSHA No 102F.
 - Column 4 Total Cases Involving Days Away From Work For all code 10 entries, count the number of times an entry (don't total the numbers) appears in Column 9A of the OSHA No 100F Log. Enter the total of this count under Column 4 of the OSHA No 102F.
 - Column 5 Total Days Away From Work For all code 10 entries, add all the entries (total the numbers which appear in Column 9A of the OSHA No 100F Log). Enter the total of this addition under Column 5 of the OSHA No 102F.
 - Column 6 Total Days of Restricted Work Activity For all code 10 entries, add all the entries (total the numbers which appear in Column 9B of the OSHA No 100F Log). Enter the total of this addition under Column 6 of the OSHA No 102F.
 - Column 7 Total Nonfatal Injury Cases without Lost Workdays For all code 10 entries, count the number of times a check-mark (✓) appears in Column 10 of the OSHA No 100F Log. Enter the total of this count under Column 7 of the OSHA No 102F.
 - Column 8 Total Injury Cases which Result in Termination of Employment or Permanent Job Transfers For all code 10 entries, count the number of times a check-mark (✓) appears in Column 11 of the OSHA No 100F Log. Enter the total of this count under Column 8 of the OSHA No 102F.

CHECK From the totals entered according to the instructions above, an easy check for accuracy can be made. Add the entries under Columns 2, 3, and 7, and this total must equal the entry for Column 1. (Columns 2+3+7 = Column 1)
- B. (Codes 21 through 29) Occupational Illness Codes Follow the procedure for A above for each illness code, entering the totals on the appropriate line of this form.
- C. (Code 30) Total - Occupational Illnesses Add the entries for codes 21 through 29 in each column and enter totals on the line for code 30.
- D. (Code 31) Total - Occupational Illnesses and Injuries Add the entries for codes 10 and 30 in each column and enter totals on the line for code 31.

CHECK If the summary has been made correctly, the entry in column 1 of the total line (code 31) of this form will equal the total number of cases on the log.
- E. (Code 40) Man-hours worked Insert the total hours worked by all employees on official duty at the reporting workplace during the reporting period, excluding vacations, holidays, sick leave, and other nonwork time. Count only the actual hours of overtime worked. If any employee worked irregular hours or if any part-time workers were employed, care should be taken to include their actual hours worked. Do not combine civilian and military man-hours worked. Please do NOT report man-days; all man-days should be converted to man hours by the reporting agency.
- F. (Code 50) Average number of employees Insert the average number of full and part-time employees during the reporting period. Include all classes of employees (i.e., administrative, supervisory, clerical, professional, non professional, technical, other related workers, etc.). Do not combine civilian and military average number of employees.
- G. (Code 51) If the average work week for the employees in your agency varies more or less than 25% of the normal work week (i.e., 40 hours), check the box for code 51; otherwise, leave it blank. Examples: (a) employees worked so much overtime that the average work week went from 40 hours per week to over 50 hours per week; (b) there are so many part-time employees in your agency that the average work week dropped from 40 hours per week to less than 30 hours per week.

APPENDIX B

INSTRUCTIONS FOR REPORT PREPARATION—FORM OSHA NO 102FF

A reportable occupational property damage incident for OSHA Form No 102FF is any accidental occurrence (a) in which Federal Government property is involved and/or a Federal employee is involved while on official Government business and (b) where property damage (including both Federal and private) results in a total of \$100 or more.

The Summary Form OSHA No 102FF shall be completed as follows:

A. A summary of occupational property damage incidents which conform to the definition stated above shall be separated and entered under one of the categories listed below. Count the number of occurrences which fit into each category and record that total on the line designated by Code 8 0 (Total Property Damage Incidents) of the OSHA No 102FF.

1.1 Government Automobile Property Damage Incident Occurrence involving a car, bus, truck, or motorcycle which is (a) owned, leased, or rented by the Federal Government and (b) used for official Government business at the time of occurrence

1.2 Private Automobile Property Damage Incident Occurrence involving a car, bus, truck, or motorcycle which is (a) not owned by the Federal Government but is authorized by the Federal Government for travel and (b) used for official Government business at the time of occurrence

NOTE. When a single occupational property damage incident involves both a Government and private automobile, report as one incident under the column which reflects the responsibility for the occurrence.

2 0 Crane, Lift, Etc., Property Damage Incident Occurrence involving construction, warehouse, supply room, or yard "Cranes, Lifts, Etc." (as defined by the safety and health standards promulgated under Section 6 of the Occupational Safety and Health Act of 1970) which is (a) operated by a Federal employee and (b) used for official Government business at the time of occurrence.

3 0 Marine Property Damage Incident Occurrence involving a water-borne craft (motorized, non-motorized, steam, sail, towed, etc.) which is capable of being used as a means of transportation on water, including special purpose floating structures not primarily designed for or used as a means of transportation on water

4 0 Aircraft Property Damage Incident Occurrence involving airborne craft (powered, towed, or free flying)

5 0 Property Damage Incidents other than Vehicles Occurrence involving Government and/or private material, equipment, or machinery which is not classified as a vehicle. This includes accidental occurrences due to use or misuse of the material, equipment, or machinery. Examples include (a) dropping a typewriter which damages either the typewriter or the material that it drops on or hits, (b) accidental bursting of a pipe which damages the nearby supplies, (c) falling material, equipment, or machinery from a scaffold, shelf, or top of building.

6 0 Fire Occurrence involving accidental burning or smoldering. This also includes damage caused as a result of (a) by-products of such an occurrence (smoke, etc.) and (b) extinguishment or control of such an occurrence

B. A summary of vehicle usage shall be recorded on the line designated by Code 9 0 on the OSHA No 102FF as follows

1.1 Government Automobiles - total number of miles agency owned, leased, or rented vehicles were driven for this reporting period

1.2 Private Automobiles - total number of miles an agency reimbursed its employees for authorized travel for this reporting period

2 0, 3 0, 4 0 Total Hours Operated - total (approximate if exact records are not available) number of hours the agency vehicles were operated for this reporting period

C. A summary of the costs of repair and/or replacement of property (dollar amount) regardless of what property (Government and/or private) which was damaged as a result of the occupational property damage incident reported for Code 8 0 of the OSHA No 102FF shall be entered on the line designated by Code 10 0 of the OSHA No 102FF. Add the costs associated with each occurrence, and enter the total of this addition under the appropriate category

D. A summary of tort claims (dollar amount) which result from the occupational property damage incidents other than breach of contract shall be entered on the line designated by Code 10 0 of the OSHA No 102FF under the category 7 0. Report only those tort claims paid out for that reporting period, regardless of when the incident occurred

NOTE: Entries on line 10 0 must be rounded off to the nearest dollar. Do not report cents. Example: Do not report \$1,257.75, but report \$1258 as the amount

OSHA No 102FF

SUMMARY REPORT OF FEDERAL OCCUPATIONAL PROPERTY DAMAGE INCIDENTS

	1 0 Automobiles		2 0 Cranes, Lifts, Etc.,	3 0 Marine	4 0 Aircraft	5 0 Incidents Other Than Vehicles	6 0 Fire	7 0 Tort Claims (Dollars)
	1 1 Gov't	1 2 Private						
8 0 Total Incidents								
9.0 Vehicle Usage:								
9 1—Total Miles Traveled								
9 2—Total Hours Operated								
10 0 Cost of Repair and/or Replacement—Direct Dollars								

APPENDIX C

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APPENDIX D

ACCIDENT CAUSE ANALYSIS REPORT

Report No /Year (Colendar) _____

INSTALLATION	MONTHLY TOTALS			QUARTER TOTAL	TOTAL TO DATE
SECTION I SHIFT					
a					
b					
c					
SECTION II PART OF BODY INJURED					
a Head					
b Eye					
c Face					
d Arm					
e Hand					
f Finger					
g Torso					
h Back					
i Chest					
j Abdomen					
k Leg					
l Foot					
m Toe					
n Other					
SECTION III AGENCY INVOLVED					
a Animals					
b Boilers and Pressure Vessels					
c Chemicals					
d Conveyors					
e Dusts					
f Electrical Apparatus					
g Elevators					
h Hand Tools					
i Highly Flammable and Hot Substances					
j Hoisting Apparatus					
k Machines					
l Material Handling					
m Mechanical Power Transmission Apparatus					
n Prime Movers and Pumps					
o Radiation and Radiating Substances					
p Vehicles					
q Walking Surfaces					
r Agencies not elsewhere classified					
SECTION IV. TYPE OF ACCIDENT					
a Striking Against					
b Struck By					
c Caught in, on, or between					
d Fall on same level					
e Fall to different level					
f Slip (not fall) or over-exertion					
g Exposure to temperature extremes					
h Contact with electric current					
i Inhalation absorption swallowing					
j Electric welding flash					
k Foreign body in eye					
l Type of accident not elsewhere classified					

NASA FORM 345 (REV APRIL 66) Previous Editions Are Obsolete

C-2

INSTALLATION	MONTHLY TOTALS			QUARTER TOTAL	TOTAL TO DATE				
SECTION V UNSAFE MECHANICAL CONDITION									
a Improper Guarding									
b Defective Substances or Equipment									
c Hazardous Arrangement									
d Improper Illumination									
e Improper Ventilation									
f Unsafe Clothing									
g No unsafe condition									
h Unsafe condition not elsewhere classified									
SECTION VI UNSAFE ACT									
a Operating without authority									
b Operating or working at unsafe speed									
c Making safety devices inoperative									
d Using unsafe equip/hands instead of equip/equip unsafely									
e Unsafe loading, placing, mixing, etc									
f Taking unsafe position or posture									
g Working or moving on dangerous equipment									
h Distraction, teasing, abusing, startling, etc									
i Failure to use safe attire or pers protective devices									
j No unsafe act									
k Unsafe act not elsewhere classified									
SECTION VII TYPE OF INJURY									
a Abrasion									
b Avulsion									
c Burn, Chemical/Cryogenic									
d Burn, Thermal									
e Contusion									
f Dermatitis									
g Foreign Body									
h Fracture									
i Laceration									
j Puncture									
k Sprain or Strain									
l Toxicological									
SECTION VIII NO LOST TIME INJURIES									
Total									
SECTION IX REMARKS									
Legend <table border="1"> <tr> <td>25</td> <td>Denotes injury cases only</td> </tr> <tr> <td>5 / 25</td> <td>Top number denotes lost time injury cases Bottom number denotes injury cases.</td> </tr> </table>						25	Denotes injury cases only	5 / 25	Top number denotes lost time injury cases Bottom number denotes injury cases.
25	Denotes injury cases only								
5 / 25	Top number denotes lost time injury cases Bottom number denotes injury cases.								
PREPARED BY:			SUBMITTED BY:						
_____			_____						

GPO 906 670

ORIGINAL PAGE IS
OF POOR QUALITY

APPENDIX E

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION TELEPHONE, PRELIMINARY AND PROGRESS REPORT FOR A NASA/NASA CONTRACTOR MISHAP			
IMPORTANT - After initial report, repeat only accident title and date to identify mishap and include only changes or additions on progress reports.			
A. MISHAP			
1. CLASS OF MISHAP ☐ a. TYPE A ACCIDENT ☐ b. TYPE B ACCIDENT ☐ c. INCIDENT		2. DATE OCCURRED	3. TIME OCCURRED
4. LOCATION			
5. DESCRIPTION			
6. CAUSE (If known)			
7. WHAT WAS/IS INVOLVED (Specify)	a. PROJECT		
	b. ACTIVITY		
	c. OPERATION		
	d. EQUIPMENT		
	e. MATERIAL		
	f. OTHER		
8. CONTRACT AND NUMBER (If applicable)		9. SUBCONTRACTOR (If applicable)	
B. PERSON(S) INVOLVED (Use Remarks Section or separate sheet, if necessary)			
NAME	SOCIAL SECURITY NO. a.	ORGANIZATION b.	NATURE OF INJURY c.
1.			
2.			
3.			
4.			
5.			

NASA FORM 1367 OCT 68 REPLACES NASA FORM 1367 TEST, WHICH IS OBSOLETE

C. PROPERTY INVOLVED		
1. DESCRIPTION		
2. OWNERSHIP		
D. PROGRAM DELAY <i>(If appropriate, indicate length of delay and impact on program)</i>		
E. OTHER FACTORS		
1.	COST (LOSS) INVOLVED	AMOUNT (Est.)
2. BOARD OF INVESTIGATION TO BE APPOINTED		
☐ a. YES <i>(Complete item E 2.c., if checked)</i> ☐ b. NO c. LIST NAME(S)/ORGANIZATION(S) WHEN KNOWN <i>(Continue in Remarks if necessary)</i>		
F. REMARKS		
G. NOTIFICATION (FOR LOCAL USE)		
1. INFORMATION RECEIVED FROM <i>(Name, organization, location)</i>		2. DATE AND TIME
3. ORGANIZATION(S) NOTIFIED		
4. MESSAGE DISPATCHED		
5. RECEIVED BY	6. SIGNATURE	b. DATE

GPO 866 651

APPENDIX F

FEDERAL WORKING GROUP ON PEST MANAGEMENT
PEST CONTROL PROGRAM REPORT

DEPARTMENT/AGENCY John F. Kennedy Space Center, NASA	DATE SUBMITTED February 10, 1977
DIVISION Admin. Opns. & Support Services	PERSON TO CONTACT/TELEPHONE NO Harrell Cunningham, 867-2642

Refer to attached instructions before completing form.

OBJECTIVE	(1) a) PROJECT NO b) SPECIFIC TARGET PEST (include life stage or stage of growth) c) PURPOSE (if crop protection, what crop?)	FVGPM-13 Sod Web Worms, caterpillars, army worms Protect grass
	(2) a) COMMON NAME b) FORMULATION c) % AI AE OR LBTAL d) REGISTRATION NO (required)	Seyin Solution 2lbs per gal Carbaryl 1 (1-nepthyl-W-methyl carbonate 23.3%. Inert ingredients 76.7% Reg # 1016-43
APPLICATION	(3) a) FORM APPLIED (Does granule formulation dilute solution (gal etc.) b) USE STRENGTH (N) OR DILUTION RATE c) DILUENT	Solution 14 oz to 20 gal water Water
	(4) a) LBS AI PER ACRE OR OTHER RATE	5 lbs per acre
	(5) a) METHOD (Aerial, ground, spot, etc.) b) EQUIPMENT (type)	Ground Power sprayer
	(6) a) ACRES OR OTHER UNIT TO BE TREATED b) NUMBER OF APPLICATIONS c) NUMBER OF SITES d) SPECIFIC DESCRIPTION OF SITES	As required, lawns, turf, grasses As required All of KSC Grasses
SENSITIVE AREAS	(7) a) MONTH(S) OF YEAR b) STATE(S)	All months Florida
	(8) a) AREAS TO BE AVOIDED b) AREAS TO BE TREATED WITH CAUTION Specify (a) or (b) c) Croplands, lakes, streams, food, human exposure, endangered species, other	Drainage ditches, outfall ditches, lakes and streams None.
REMARKS	(9) a) PRECAUTIONS TO BE TAKEN b) USE IN TRAINED/CERTIFIED PERSONNEL c) STATE AND LOCAL COORDINATION d) OTHER PESTICIDES BEING APPLIED TO SAME SITE e) MONITORING f) OTHER	No spraying when winds exceed 8 mph. Applied by trained personnel supervised by Graduate Entomologist. None. None. Reviewed by NASA Agronomist.

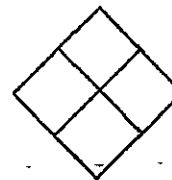
FVGPM Form 1 (9/75)

APPENDIX G

PRODUCT DESIGNATION

**MATERIAL SAFETY
DATA SHEET**

Form Approved
Budget Bureau No.
Approval Expires
Form No. OSHA-



SECTION I SOURCE AND NOMENCLATURE	
MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
ADDRESS (Number, Street, City, State, ZIP Code)	
TRADE NAME AND SYNONYMS	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS	FORMULA

SECTION II HAZARDOUS INGREDIENTS						
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.

SECTION III PHYSICAL DATA	
BOILING POINT °F.	VAPOR PRESSURE mm Hg.
MELTING POINT °F.	VAPOR DENSITY (Air=1)
SPECIFIC GRAVITY (H ₂ O=1)	EVAPORATION RATE (_____ =1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR	

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA		
SPECIAL FIRE FIGHTING PROCEDURES		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION	
SECTION V HEALTH HAZARD DATA	
TOXIC LEVEL	CARCINOGENIC
PRINCIPLE ROUTES OF ABSORPTION	SKIN AND EYE IRRITATION
RELEVANT SYMPTOMS OF EXPOSURE	
EFFECTS OF CHRONIC EXPOSURE	
EMERGENCY AND FIRST AID PROCEDURES	
SECTION VI REACTIVITY DATA	
CONDITIONS CONTRIBUTING TO INSTABILITY	
CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION	
INCOMPATIBILITY (Materials to Avoid)	
HAZARDOUS DECOMPOSITION PRODUCTS	
SECTION VII SPILL OR LEAK PROCEDURES	
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED	
WASTE DISPOSAL METHOD	
SECTION VIII SPECIAL PROTECTION INFORMATION	
VENTILATION REQUIREMENTS LOCAL EXHAUST	PROTECTIVE EQUIPMENT (Specify Types) EYE
MECHANICAL (General)	GLOVES
SPECIAL	RESPIRATOR
OTHER PROTECTIVE EQUIPMENT	
SECTION IX SPECIAL PRECAUTIONS	
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE	
OTHER PRECAUTIONS	

Signature _____

Address _____

Date _____

APPENDIX H

U.S. DEPARTMENT OF LABOR EMPLOYMENT STANDARDS ADMINISTRATION OFFICE OF WORKERS' COMPENSATION PROGRAMS		FEDERAL EMPLOYEE'S NOTICE OF TRAUMATIC INJURY AND CLAIM FOR CONTINUATION OF PAY/COMPENSATION	
1 Name of Injured Employee (Last, first, middle)		2 Date of Birth	3 ☐ Male ☐ Female
4 Social Security Number		5 Employee's Home Mailing Address (No., street, city, state, zip code)	
6 Home Telephone Area Code Number		7 Name and Address of Employing Agency	
8 Place Where Injury Occurred (e.g., 2nd floor, Main Post Office Bldg., 12th & Pine)		9 Date and Hour of Injury (mo., day, year) ☐ AM ☐ PM	
10 Date of This Notice (mo., day, year)		11 Dependents Wife/Husband ☐ Children Under 18 Years Old ☐	
12 Employee's Occupation		13 Cause of Injury (Describe how and why the injury occurred)	
14 Nature of Injury (Identify the part of the body injured, e.g., fractured left leg, etc.)		15 If This Notice and Claim Was Not Filed With The Employing Agency Within 2 Working Days After The Injury, Explain The Reason For The Delay.	
16. I certify that the injury described above was sustained in performance of duty as an employee of the United States Government and that it was not caused by my willful misconduct, intent to injure myself or another person, nor by my intoxication. I hereby claim medical treatment, if needed, and the following, as checked below, while disabled for work: ☐ a Sick and/or annual leave ☐ b Continuation of regular pay not to exceed 45 days and compensation for wage loss if disability for work continues beyond 45 days (If my claim is denied, I understand that the continuation of my regular pay shall be charged to sick or annual leave, or be deemed an overpayment within the meaning of 5 USC 5584).			
_____ Signature of Employee or Person Acting on His/Her Behalf			
17 Statement of Witness (Describe what you saw, heard or know about this injury)			
18 Witness' Signature		19 Witness' Address	
20 Date Signed (mo., day, year)			

Form CA 1
Rev. Nov. 1974

OFFICIAL SUPERIOR'S REPORT OF TRAUMATIC INJURY			
21 Department or Agency		22 Bureau or Office	
23 Name and Address of Reporting Office (No , street, city, state, Zip Code)			
24 Regular Work Day Begins ☐ AM ☐ PM Ends ☐ AM ☐ PM		25 Number of Hours Worked Per Day	26 Circle Days Paid Per Week S M T W T F S
27 Date and Hour of Injury (mo , day, year) ☐ AM ☐ PM	28 Date Reporting Office Received Notice of Injury (mo , day, year)	29 Date and Hour Stopped Work (mo , day, year) ☐ AM ☐ PM	30 If Pay Has Been Terminated, Give Date (mo , day, year)
31. 45 Day Period Begins (mo , day, year)	32. Pay Rate When Employee Stopped Work \$ _____ per _____	33 Date and Hour Employee Returned to Work (mo , day, year) ☐ AM ☐ PM	34 Name of Supervisor At Time of Injury
35 Was Employee in Performance of Duty At The Time of Injury? ☐ Yes, ☐ No If No, Furnish A Detailed Explanation Or A Copy of Employing Agency's Investigation Report.			
36 Was Injury Caused By Willful Misconduct, Intoxication or Intent To Injure Self or Another? ☐ Yes ☐ No If Yes, Furnish Detailed Report.			
37. Was Injury Caused By Third Party? ☐ Yes ☐ No If Yes, Furnish Name and Address of Party Responsible			
38 Date Employee First Obtained Medical Care for The Injury (mo., day, year)	39 Name and Address of Physician First Providing Medical Care		40 Do Medical Reports Show Employee is Disabled For Work? ☐ Yes ☐ No
41 Does Your Knowledge of The Facts About This Injury Agree With The Statements of The Employee And/Or Witness? ☐ Yes ☐ No If No, Furnish A Detailed Explanation			
42. Does The Employing Agency Controvert Continuation of Pay? ☐ Yes ☐ No If Yes, Give Full Explanation For Basis of Controversion (See Item 6 of Instruction Sheet). Attach Additional Sheets If More Space is Needed			
43. Signature of Supervisor		44 Title and Office Phone Number	45. Date (mo , day, year)

APPENDIX I

U S DEPARTMENT OF LABOR Employment Standards Administration Office of Workers Compensation Programs (OWCP)		REQUEST FOR EXAMINATION AND/OR TREATMENT	
PART A - AUTHORIZATION			
1. NAME AND ADDRESS OF THE MEDICAL FACILITY OR PHYSICIAN AUTHORIZED TO PROVIDE THE MEDICAL SERVICE			
2. EMPLOYEE'S NAME (Last, first, middle)		3. DATE OF INJURY (mo., day, year)	4. OCCUPATION
5. DESCRIPTION OF INJURY OR DISEASE			
6. YOU ARE AUTHORIZED TO PROVIDE MEDICAL CARE FOR THE EMPLOYEE SUBJECT TO THE FOLLOWING CONDITIONS			
☐ A - FURNISH OFFICE AND/OR HOSPITAL TREATMENT AS NECESSARY FOR THE EFFECTS OF THIS INJURY. ANY SURGERY, OTHER THAN EMERGENCY, MUST HAVE PRIOR OWCP APPROVAL.			
☐ B - THERE IS DOUBT WHETHER THE EMPLOYEE'S CONDITION IS CAUSED BY AN INJURY SUSTAINED IN THE PERFORMANCE OF DUTY OR IS OTHERWISE RELATED TO HIS EMPLOYMENT. YOU ARE AUTHORIZED TO EXAMINE THE EMPLOYEE, USING INDICATED NON SURGICAL DIAGNOSTIC STUDIES, AND PROMPTLY ADVISE THE UNDERSIGNED WHETHER YOU BELIEVE THE CONDITION IS DUE TO THE ALLEGED INJURY OR TO ANY CIRCUMSTANCE OF THE EMPLOYMENT. PENDING FURTHER ADVICE, YOU MAY PROVIDE NECESSARY CONSERVATIVE TREATMENT IF YOU BELIEVE THE CONDITION MAY BE DUE TO THE INJURY OR TO THE EMPLOYMENT.			
7. IF A DISEASE OR ILLNESS IS INVOLVED, OWCP APPROVAL FOR ISSUING AUTHORIZATION UNDER ITEM 6B ABOVE WAS OBTAINED FROM _____ (Name of OWCP official)			
8. SIGNATURE OF AUTHORIZING OFFICIAL (Sign all copies)		9. TITLE	
10. LOCAL EMPLOYING AGENCY TELEPHONE NUMBER		11. DATE (mo., day, year)	
12. SEND ONE COPY OF YOUR REPORT TO (Fill in address) U S DEPARTMENT OF LABOR Employment Standards Administration Office of Workers Compensation Programs		13. NAME AND ADDRESS OF EMPLOYEE'S PLACE OF EMPLOYMENT Dept. or Agency Bureau or Office Local Address (Including Zip Code)	

FORM CA-16
(REV. DEC. 1974)

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PART B — ATTENDING PHYSICIAN'S REPORT						
14. EMPLOYEE'S NAME (Last, first middle)						
15. WHAT HISTORY OF INJURY OR DISEASE DID EMPLOYEE GIVE YOU?						
16. IS THERE ANY HISTORY OR EVIDENCE OF PRE-EXISTING INJURY, DISEASE OR PHYSICAL IMPAIRMENT? (If yes, please describe)						
☐ Yes ☐ No						
17. WHAT ARE YOUR FINDINGS (include results of x-rays, laboratory tests, etc.)?				18. WHAT IS YOUR DIAGNOSIS?		
19. DO YOU BELIEVE THE CONDITION FOUND WAS CAUSED OR AGGRAVATED BY THE EMPLOYMENT ACTIVITY DESCRIBED? (Please explain your answer if there is doubt.)						
☐ Yes ☐ No						
20. DID INJURY REQUIRE HOSPITALIZATION? ☐ Yes ☐ No If yes: date of admission (mo., day, year) Date of discharge (mo., day, year)				21. IS ADDITIONAL HOSPITALIZATION REQUIRED? ☐ Yes ☐ No		
22. SURGERY (If any, describe type)				23. DATE SURGERY PERFORMED (mo., day, year)		
24. WHAT (Other) TYPE OF TREATMENT DID YOU PROVIDE?				25. WHAT PERMANENT EFFECTS IF ANY DO YOU ANTICIPATE?		
26. DATE OF FIRST EXAMINATION (mo., day, year)		27. DATE(S) OF TREATMENT (mo., day, year)		28. DATE OF DISCHARGE FROM TREATMENT (mo., day, year)		
29. PERIOD OF DISABILITY (If termination date unknown, so indicate) (mo., day, year) TOTAL DISABILITY FROM _____ TO _____ PARTIAL DISABILITY FROM _____ TO _____				30. DATE EMPLOYEE ABLE TO RESUME WORK (mo., day, year) LIGHT WORK REGULAR WORK		
31. IF EMPLOYEE IS ABLE TO RESUME WORK, HAS HE/SHE BEEN ADVISED? ☐ YES ☐ NO IF YES, FURNISH DATE ADVISED (month, day, year)						
32. IF EMPLOYEE IS ABLE TO RESUME ONLY LIGHT WORK, INDICATE THE EXTENT OF PHYSICAL LIMITATIONS AND THE TYPE OF WORK, THAT COULD REASONABLY BE PERFORMED WITH THESE LIMITATIONS						
33. GENERAL REMARKS AND RECOMMENDATION FOR FUTURE CARE, IF INDICATED						
34. DO YOU SPECIALIZE? ☐ Yes ☐ No (If yes, state specialty)						
35. SIGNATURE OF PHYSICIAN			36. ADDRESS (Number, street, city, state, zip code)		37. PHYSICIAN'S SOCIAL SECURITY NUMBER	
					38. DATE OF REPORT (mo., day, year)	
39. MEDICAL BILL Charges for your services may be presented in the space below or on your billhead stationery						
Date or period of treatment	Service or supplies must be itemized	Quantity or number	Unit price		Amount	
			Cost	Per	\$	¢
TOTAL						

APPENDIX J

SECTION A – GENERAL INFORMATION

SECTION B - HEALTH PROGRAM INFORMATION3. HEALTH SERVICES OFFERED (CHECK APPLICABLE BOXES—INDICATE NUMBER PERFORMED—DATA FROM PART II)

4. VOLUNTARY HEALTH MAINTENANCE EXAM CRITERIA

SECTION C - MEDICAL-BEHAVIORAL COUNSELINGPage 1

CSC 1210
September 1976

BTN NO 792-20

**FEDERAL EMPLOYEES OCCUPATIONAL
HEALTH AND ALCOHOLISM AND
DRUG ABUSE PROGRAMS ANNUAL REPORT
FY 76**

PART II – OCCUPATIONAL HEALTH SERVICES

SECTION A – FIXED OCCUPATIONAL HEALTH UNIT

1. OPERATED BY

2. ADDRESS NO & STREET	CITY	STATE/COUNTY	ZIP
-----------------------------------	-------------	---------------------	------------

3 STAFFING (FEDERAL AND NON-FEDERAL)	FULL TIME	PART TIME
(a) PHYSICIANS		
(b) NURSES		
(c) SUPPORT (SPECIFY)		

SECTION B – ALTERNATIVE OCCUPATIONAL HEALTH UNIT

1. NAME OF PROVIDER

2. ADDRESS NO & STREET	CITY	STATE/COUNTY	ZIP
-----------------------------------	-------------	---------------------	------------

3. TYPE OF FACILITY (SPECIFY)

SECTION C – HEALTH SERVICES OFFERED (INDICATE NUMBER PERFORMED AND RE-ENTER IN PART I B 3)

TYPE OF SERVICE	FIXED UNIT	ALTERNATIVE	BOTH
1 EMERGENCY TREATMENT AND FIRST AID			
2 VOLUNTARY UNIPHASIC HEALTH SCREENING			
(a) PAP SMEAR			
(b) DIABETES			
(c) GLAUCOMA			
(d) HEARING			
(e) TB			
(f) VISION			
(g) HYPERTENSION			
(h) OTHER (SPECIFY)			
(i) OTHER (SPECIFY)			
(j) OTHER (SPECIFY)			
(k) OTHER (SPECIFY)			
3 MULTIPHASIC HEALTH SCREENING			
4 IMMUNIZATIONS			
5. ASSISTANCE IN DETECTING AND SOLVING ENVIRONMENTAL HEALTH SAFETY AND SANITATION PROBLEMS			
6 TREATMENTS REQUESTED BY PERSONAL PHYSICIAN			
7. HEALTH GUIDANCE			
8 REFERRALS TO PERSONAL PHYSICIAN OR DENTIST			
9 MANDATORY PHYSICAL EXAMS			
(a) PRE-EMPLOYMENT			
(b) FITNESS FOR DUTY			
(c) MANDATORY IN SERVICE			
10 VOLUNTARY PHYSICAL EXAMS			

APPENDIX K

116
7...

INTENTIONALLY BLANK

MEMO FROM THE HEALTH UNIT

TO: YZ/Mr. William W. Boyes
Safety and Environmental Health Office

_____ sustained a work-related injury
Name of Employee

on _____
Date of Injury

Place of Injury:

Time:

Cause:

Nature of Injury:

Teresa K. Brown
Medical Data Technician
Office of Occupational Medicine

Date

APPENDIX L

FORM FROM THE HEALTH UNIT

TO: - BFH/Ms. Joyan Thompson

1. Name of Injured Employee _____
2. Social Security Number _____
3. Place where Injury Occurred _____

4. Date and Hour of Injury _____
5. Date of CA-1 Notice _____
6. Employee Elects:
 Lost time to be charged to continuation of pay _____
 Lost time will be charged to sick leave _____
 Lost time will be charged to annual leave _____
7. Regular work day: Begins _____ Ends _____
8. Date & Hour Stopped Work _____
9. 45 Day Period Begins _____
10. Date and Hour Employee Returned to work _____
11. Was Employee In Performance of Duty at The Time of Injury? YES _____ NO _____
 (if NO Give Explanation)
12. Does the Employing Agency Controvert Continuation of Pay? YES _____ NO _____
 (if NO Give Explanation)
13. Date CA-1 was Sent to OWCP _____

Teresa K. Brown
Medical Data Technician
Office of Occupational Medicine

Date

APPENDIX M

INSTRUCTIONS FOR COMPLETING LOG OF FEDERAL OCCUPATIONAL INJURIES AND ILLNESSES (OSHA FORM NO. 100F)

Column 1—CASE OR FILE NUMBER

Any number may be entered which will facilitate comparison with supplementary records

Column 2—DATE OF INJURY OR ILLNESS

For occupational injuries enter the date of the work accident which resulted in injury. For occupational illnesses enter the date of initial diagnosis of illness, or, if absence occurred before diagnosis, the first day of the absence in connection with which the case was diagnosed

Column 3—EMPLOYEE'S NAME

Column 4—OCCUPATION

Enter the occupational title of the job to which the employee was assigned at the time of injury or illness. In the absence of a formal occupational title, enter a brief description of the duties of the employee

Column 5—DEPARTMENT

Enter the name of the department to which employee was assigned at the time of injury or illness, whether or not employee was actually working in that department at the time. In the absence of formal department titles, enter a brief description of normal workplace to which employee is assigned

Column 6—NATURE OF INJURY OR ILLNESS AND PART(S) OF BODY AFFECTED

Enter a brief description of the injury or illness and indicate the part or parts of body affected. Where entire body is affected, the entry "body" can be used

Column 7—INJURY OR ILLNESS CODE

Enter the one code which most accurately describes the nature of injury or illness. A list of codes appears at the bottom of the log. A more complete description of occupational injuries and illnesses appears below in "Definitions"

Column 8—FATALITIES

If the occupational injury or illness resulted in death, enter date of death

Column 9—LOST WORKDAY CASES

Enter a check for each case which involves days away from work, or days of restricted work activity, or both. Each lost workday case also requires an entry in column 9A or column 9B or both

Column 9A—LOST WORKDAYS—DAYS AWAY FROM WORK

Enter the number of workdays (consecutive or not) on which the employee would have worked but could not because of occupational injury or illness. The number of lost workdays

should not include the day of injury or onset of illness or any days on which the employee would not have worked even though able to work

NOTE: For employees not having a regularly scheduled shift, i.e., certain truck drivers, construction workers, part-time employees, etc., it may be necessary to estimate the number of lost workdays. Estimates of lost workdays shall be based on prior work history of the employee and days worked by employees, not ill or injured, working in the department and/or occupation of the ill or injured employee

Column 9B—LOST WORKDAYS—DAYS OF RESTRICTED WORK ACTIVITY

Enter the number of workdays (consecutive or not) on which because of injury or illness

- 1) the employee was assigned to another job on a temporary basis,
 - 2) the employee worked at a permanent job less than full time, or
 - 3) the employee worked at a permanently assigned job but could not perform all duties normally connected with it
- The number of lost workdays should not include the day of injury or onset of illness or any days on which the employee would not have worked even though able to work

Column 10—NONFATAL CASES WITHOUT LOST WORKDAYS

Enter a check in Column 10 for all cases of occupational injury or illness, which did not involve fatalities or lost workdays but did result in

- Transfer to another job or termination of employment, or
- Medical treatment, other than first aid, or
- Diagnosis of occupational illness, or
- Loss of consciousness, or
- Restriction of work or motion

Column 11—TRANSFER TO ANOTHER JOB OR TERMINATION OF EMPLOYMENT WITHOUT LOST WORKDAYS

If the check in Column 10 represented a transfer to another job or termination of employment with no lost workdays, enter another check in Column 11

INITIALING REQUIREMENT

Each line entry regarding an occupational injury or illness must be initialed in the right hand margin by the person responsible for the accuracy of the entry. Changes in an entry also must be initialed in the affected column

CHANGES IN EXTENT OF OR OUTCOME OF INJURY OR ILLNESS

If there is a change in an occupational injury or illness case which affects entries in Columns 9, 10, or 11, the first entry should be lined out and a new entry made. For example, if an injured employee at first required only medical treatment but later lost workdays, the check in Column 10 should be lined out and the number of lost workdays entered in Column 9

In another example, if an employee with an occupational illness lost workdays, returned to work, and then dies of the illness, the workdays noted in Column 9 should be lined out and the date of death entered in Column 8

An entry may be lined out if later found to be a nonoccupational injury or illness.

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This is the separate log for Civilian Personnel ☐ Military (in combat) Personnel ☐

[illegible]

DEFINITIONS OF TERMS FOR USE IN RECORDING FEDERAL OCCUPATIONAL INJURIES AND ILLNESSES

OCCUPATIONAL INJURY is any injury such as a cut, fracture, sprain, amputation, etc., which results from a work accident or from exposure in the work environment

OCCUPATIONAL ILLNESS of an employee is any abnormal condition or disorder, other than one resulting from an occupational injury, caused by exposure to environmental factors associated with his employment. It includes acute and chronic illnesses or diseases which may be caused by inhalation, absorption, ingestion, or direct contact, and which can be included in the categories listed below

The following listing gives the categories of occupational illnesses and disorders that will be utilized for the purpose of classifying recordable illnesses. The identifying codes are those to be used in Column 7 of the log. For purposes of information, examples of each category are given. These are typical examples, however, and are not to be considered to be the complete listing of the types of illnesses and disorders that are to be counted under each category

- (21) Occupational Skin Diseases or Disorders
Examples: Contact dermatitis, eczema, or rash caused by primary irritants and sensitizers or poisonous plants, oil acne, chrome ulcers, chemical burns or inflammations, etc
- (22) Dust Diseases of the Lungs (Pneumoconioses)
Examples: Silicosis, asbestosis, coal worker's pneumoconiosis, byssinosis, and other pneumoconioses
- (23) Respiratory Conditions Due to Toxic Agents
Examples: Pneumonitis, pharyngitis, rhinitis or acute congestion due to chemicals, dusts, gases, or fumes, farmer's lung, etc.
- (24) Poisoning (Systemic Effects of Toxic Materials)
Examples: Poisoning by lead, mercury, cadmium, arsenic or other metals, poisoning by carbon monoxide, hydrogen sulfide or other gases, poisoning by benzol, carbon tetrachloride, or other organic solvents, poisoning by insecticide sprays such as parathion, lead arsenate, poisoning by other chemicals such as formaldehyde, plastics and resins, etc.
- (25) Disorders Due to Physical Agents (Other Than Toxic Materials)
Examples: Heatstroke, sunstroke, heat exhaustion and other effects of environmental heat, freezing, frostbite and

effects of exposure to low temperatures, caisson disease, effects of ionizing radiation (isotopes, X-rays, radium), effects of nonionizing radiation (welding flash, ultraviolet rays, microwaves, sunburn), etc

- (26) Disorders Due to Repeated Trauma
Examples: Noise induced hearing loss, synovitis, tenosynovitis, and bursitis, Raynaud's phenomena, and other conditions due to repeated motion, vibration or pressure
- (29) All Other Occupational Illnesses
Examples: Anthrax, brucellosis, infectious hepatitis, malignant and benign tumors, food poisoning, histoplasmosis, coccidioidomycosis, etc

RECORDABLE OCCUPATIONAL INJURIES AND ILLNESSES are any occupational injuries or illnesses which result in:

- 1) FATALITIES, regardless of the time between the injury and death, or the length of the illness; or
- 2) LOST WORKDAYS CASES, other than fatalities that result in lost workdays; or
- 3) NONFATAL CASES WITHOUT LOST WORKDAYS, which result in transfer to another job or termination of employment, or require medical treatment (as defined below), or involve loss of consciousness or restriction of work or motion. This category also includes any diagnosed occupational illnesses which are reported to the Agency but are not classified as fatalities or lost workday cases

MEDICAL TREATMENT includes treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does NOT include first aid treatment (one-time treatment and subsequent observation of minor scratches, cuts, burns, splinters, and so forth, which do not ordinarily require medical care) even though provided by a physician or registered professional personnel.

ESTABLISHMENT: A single physical location where business is conducted or where services or industrial operations are performed (For example: warehouse, or central administrative office.) Where distinctly separate activities are performed at a single physical location (such as contract construction activities operated from the same physical location as a lumber yard) each activity shall be treated as a separate establishment.

Agencies engaged in activities such as agriculture, construction, transportation, communications, and electric, gas and sanitary services which may be physically dispersed, records may be maintained at a place to which employees report each day.

Records for personnel who do not primarily report to work at a single establishment, such as traveling technicians, engineers, etc. shall be maintained at the location from which they are paid or the base from which personnel operate to carry out their activities.

WORK ENVIRONMENT is comprised of the physical location, equipment, materials processed or used, and the kinds of operations performed by an employee in the performance of his work, whether on or off the Agency's premises.

APPENDIX N

REPORT OF MEDICAL HISTORY (THIS INFORMATION IS FOR OFFICIAL AND MEDICALLY-CONFIDENTIAL USE ONLY AND WILL NOT BE RELEASED TO UNAUTHORIZED PERSONS)											
1. LAST NAME—FIRST NAME—MIDDLE NAME						2. SOCIAL SECURITY OR IDENTIFICATION NO.					
3. HOME ADDRESS (No street or RFD city or town, State, and ZIP CODE)						4. POSITION (Title grade, component)					
5. PURPOSE OF EXAMINATION				6. DATE OF EXAMINATION		7. EXAMINING FACILITY OR EXAMINER, AND ADDRESS (Include ZIP Code)					
8. STATEMENT OF EXAMINEE'S PRESENT HEALTH AND MEDICATIONS CURRENTLY USED (Follow by description of past history, if complaint exists)											
9. HAVE YOU EVER (Please check each item)											
YES	NO	(Check each item)									
		Lived with anyone who had tuberculosis									
		Coughed up blood									
		Bled excessively after injury or tooth extraction									
		Attempted suicide									
		Been a sleepwalker									
10. DO YOU (Please check each item)											
YES	NO	(Check each item)									
		Wear glasses or contact lenses									
		Have vision in both eyes									
		Wear a hearing aid									
		Stutter or stammer habitually									
		Wear a brace or back support									
11. HAVE YOU EVER HAD OR HAVE YOU NOW (Please check at left of each item)											
YES	NO	DON'T KNOW	(Check each item)			YES	NO	DON'T KNOW	(Check each item)		
			Scarlet fever, erysipelas						Cramps in your legs		
			Rheumatic fever						Frequent indigestion		
			Swollen or painful joints						Stomach, liver or intestinal trouble		
			Frequent or severe headache						Gall bladder trouble or gallstones		
			Dizziness or fainting spells						Jaundice or hepatitis		
			Eye trouble						Adverse reaction to serum, drug, or medicine		
			Ear, nose, or throat trouble						Broken bones		
			Hearing loss						Tumor, growth, cyst, cancer		
			Chronic or frequent colds						Rupture/hemorrhage		
			Severe tooth or gum trouble						Fits or rectal disease		
			Sinusitis						Frequent or painful urination		
			Hay Fever						Bad wetting since age 12		
			Head injury						Kidney stone or blood in urine		
			Skin diseases						Sugar or albumin in urine		
			Thyroid trouble						VD—Syphilis, gonorrhea etc.		
			Tuberculosis						Recent gain or loss of weight		
			Asthma						Arthritis Rheumatism or Bursitis		
			Shortness of breath						Bone, joint or other deformity		
			Pain or pressure in chest						Lameness		
			Chronic cough						Loss of finger or toe		
			Palpitation or pounding heart						Painful or "lick" shoulder or elbow		
			Heart trouble						Recurrent back pain		
			High or low blood pressure								
13. WHAT IS YOUR USUAL OCCUPATION?											
14. ARE YOU (Check one)											
☐ Right handed ☐ Left handed											

93-101

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YES	NO	CHECK EACH ITEM YES OR NO EVERY ITEM CHECKED YES MUST BE FULLY EXPLAINED IN BLANK SPACE ON RIGHT		
		15 Have you been refused employment or been unable to hold a job or stay in school because of A. Sensitivity to chemicals, dust, sun light etc. B. Inability to perform certain motions C. Inability to assume certain positions D. Other medical reasons (If yes, give reasons)		
		16 Have you ever been treated for a mental condition? (If yes, specify when, where, and give details)		
		17 Have you ever been denied life insurance? (If yes, state reason and give details)		
		18 Have you had or have you been advised to have any operations? (If yes describe and give age at which occurred.)		
		19 Have you ever been a patient in any type of hospitals? (If yes specify when where why and name of doctor and complete address of hospital)		
		20 Have you ever had any illness or injury other than those already noted? (If yes specify when where, and give details)		
		21 Have you consulted or been treated by clinics, physicians, healers, or other practitioners within the past 5 years for other than minor illnesses? (If yes give complete address of doctor, hospital clinic, and details)		
		22 Have you ever been rejected for military service because of physical, mental, or other reasons? (If yes give date and reason for rejection)		
		23 Have you ever been discharged from military service because of physical, mental or other reasons? (If yes give date reason and type of discharge whether honorable other than honorable, for unfitness or unsuitability)		
		24 Have you ever received, is there pending or have you applied for pension or compensation for existing disability? (If yes specify what kind granted by whom and what amount, when why)		
I certify that I have reviewed the foregoing information supplied by me and that it is true and complete to the best of my knowledge I authorize any of the doctors hospitals or clinics mentioned above to furnish the Government a complete transcript of my medical record for purposes of processing my application for this employment or service				
TYPED OR PRINTED NAME OF EXAMINEE		SIGNATURE		
NOTE. HAND TO THE DOCTOR OR NUPSE, OR IF MAILED MARK ENVELOPE "TO BE OPENED BY MEDICAL OFFICER ONLY" 25 Physician's summary and elaboration of all pertinent data (Physician shall comment on all positive answers in items 9 through 24 Physician may develop by interview any additional medical history he deems important, and record any significant findings here.)				
TYPED OR PRINTED NAME OF PHYSICIAN OR EXAMINER		DATE	SIGNATURE	NUMBER OF ATTACHED SHEETS

REVERSE OF STANDARD FORM 93

GPO : 1971 O - 419 371

APPENDIX O



National Aeronautics and
Space Administration

Washington, D C
20546

Reply to Attn of QG

HEADQUARTERS EMPLOYEES' HEALTH EXAMINATION PROGRAM
RECORD OF INTERVAL MEDICAL HISTORY

NAME: _____ DATE: _____

SOCIAL SECURITY NO. _____
(For up-date of medical record and information for Health
Clinic Physician)

1. Since your last physical examination, have you had any health problems (sick, hospitalization, etc.)? If so, please describe them briefly.

2. Are you now taking, or have you taken any medication in the past year? If so, please state the name(s) of the medication(s).

3. Do you have any specific questions you wish to ask the Health Clinic physician?

4. Please give a brief description of the state of your health at this time (in your opinion).

APPENDIX P

RUN DATE 08/05/77
 HMIS F
 10 NASA HEADQUARTERS
 EXAM TYPE A/O 07/25/77, 01 HEALTH MAINTENANCE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
 MEDICAL INFORMATION SYSTEM
 HEALTH PROFILE REPORT
 EXAMINATION

PAGE

MEDICAL IDENTIFICATION NUMBER:

SEX M DOB 06/29/28 NCC. 72511

DATE OF EXAMINATION AGE	07/25/77 49	06/23/76 48	06/12/75 47	05/24/74 46	06/04/73 45	07/06/72 44	06/03/71 43	06/09/70 42	06/10/69 41	03/08/68 38
HEIGHT	71	71	77	72	72	72	72	71	72	72
WEIGHT	167	180	187	174	175	177	175	174	172	172
SYSTOLIC BLOOD PRESSURE	122	100	124	116	124	118	112	122	120	108
DIASTOLIC BLOOD PRESSURE	076	068	084	068	084	080	074	080	090	062
PULSE	072		057	059	057	085	057	050	056	072
SIGMOIDOSCOPY			WNL	WNL	WNL	WNL	WNL	WNL	WNL	WNL
RECTAL			WNL	WNL	WNL	ONL	ONL	WNL	WNL	WNL
PAP SMEAR										
VISUAL TESTING		WNL	WNL	WNL	WNL	WNL	WNL	WNL	WNL	WNL
AUDIO TESTING	ONL	ONL	ONL	ONL	ONL	WNL	WNL	WNL	WNL	WNL
TONOMETRY										
OD	17	15			22	14	28	20	14	
OS	17	15			20	16	22	22	15	
FORCED EXPIRATORY VOLUME	089	088	094	099	098	094	094	094	094	
HEMATOLOGY										
HGB	15.9	15.7	01.5	16.0	15.0	15.2	15.5	15.4	15.8	15.2
HCT	44	46	45	47	45	45	45	45	46	45
WBC	04600	05000	06000	06500	05500	05700	06400	05700	06400	05500
PMN	68		67	62	61	51	64	52	69	72
LYMPH	24	35	26	33	31	41	22	32	24	24
MONO	03	01	05		04	01	08	10		02
EOS	03	01	02	05	03	07	05	06	07	02
BASO	02				02		01			
ESR			02	02	04	01	04	02		02
CHEMISTRY										
BLOOD SUGAR	074	095	100	100	095	074	076	076	070	076
CHOLESTEROL	213	229	260	235	255	255	250	210	250	185
UREA NITROGEN	15	16	24	17	25	15	14	15	21	10
URIC ACID	06.6	05.6	06.4	06.0	06.8	07.7	05.9	05.5	05.6	05.7
TRIGLYCERIDES	090	155		053						
URINALYSIS										
SP GR	1.020	1.025	1.032	1.023	1.014	1.027	1.024	1.023	1.022	1.020
PH										
ALBUMIN		0	0	0	0	0	0	0	0	0
GLUCOSE	0	0	0	0	0	0	0	0	0	0
RBC PER HPF		00		01						
WBC PER HPF	03	01	02	01						
CASTS										
CIGARETTES SMOKED PER DAY	00	00	00	00	00	00	00	00	00	00

RUN DATE 08/05/77
 HMIS-F
 10 NASA HEADQUARTERS
 EXAM TYPE A/O 07/25/77. 01 HEALTH MAINTENANCE
 MEDICAL IDENTIFICATION NUMBER,

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
 MEDICAL INFORMATION SYSTEM
 HEALTH PROFILE REPORT
 EXAMINATION
 SEX, M DOB, 06/29/28 NCC 72511

PAGE

DATE OF EXAM	DIAGNOSES FROM EXAMINATION	DIAGNOSES FROM ELECTROCARDIOGRAM	DIAGNOSES FROM CHEST X-RAY
07/25/77	536 9 OTHER (INDIGESTION NOS, ETC) , 389 9 IMPAIRED HEARING, ONE OR BOTH EARS	00.0 WITHIN NORMAL LIMITS	00 WITHIN NORMAL LIMITS
06/23/76	000 0 NORMAL EXAMINATION	00.0 WITHIN NORMAL LIMITS	00 WITHIN NORMAL LIMITS
6/12/75	731 SYNOVITIS, BURSITIS & TENOSYNOVITIS	00 0 WITHIN NORMAL LIMITS	00 WITHIN NORMAL LIMITS
05/24/74	300 0 ANXIETY NEUROSIS 791 HEADACHE	00 0 WITHIN NORMAL LIMITS	00 WITHIN NORMAL LIMITS
06/04/73	000 0 NORMAL EXAMINATION	00 0 WITHIN NORMAL LIMITS	00 WITHIN NORMAL LIMITS
07/06/72	455 HEMORRHOIDS	00 0 WITHIN NORMAL LIMITS	00 WITHIN NORMAL LIMITS
06/03/71	000 0 NORMAL EXAMINATION	00.0 WITHIN NORMAL LIMITS	00 WITHIN NORMAL LIMITS
06/09/70	507 HAY FEVER	00 0 WITHIN NORMAL LIMITS	00 WITHIN NORMAL LIMITS
06/10/69	389 9 IMPAIRED HEARING, ONE OR BOTH EARS	00.0 WITHIN NORMAL LIMITS	00 WITHIN NORMAL LIMITS
03/08/68	564.1 IRRITABLE COLON	00 0 WITHIN NORMAL LIMITS	00 WITHIN NORMAL LIMITS

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 OF POOR QUALITY

RUN DATE. 08/05/77

INSTALLATION: 10 NASA HEADQUARTERS

MEDICAL IDENTIFICATION NUMBER:

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MEDICAL INFORMATION SYSTEM
INJURY AND ILLNESS VISITS

SEX: M

DOB: 06/20/28

NCC: 72511

DATE OF
VISIT

REASON FOR VISIT

DIAGNOSIS FROM VISIT

01/14/76

32 NON-OCCUPATIONAL DISEASE

914 SUPERFICIAL INJ - HAND, NOT JUST FNG

01/13/76

31 NON-OCCUPATIONAL DISEASE

914 SUPERFICIAL INJ - HAND, NOT JUST FNG

RUN DATE: 08/05/77

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MEDICAL INFORMATION SYSTEM
DYNAMIC ELECTROCARDIOGRAM ANALYSIS

PAGE 1

INSTALLATION: 10 NASA HEADQUARTERS

MEDICAL IDENTIFICATION NUMBER:

SEX: M

DOB: 06/29/28

NCC: 72511

DATE OF DECG	DIAGNOSIS FROM DECG	LOW HEART RATE	HIGH HEART RATE	MEAN HEART RATE	TOTAL VE	TOTAL SVE
06/01/75	000 WITHIN NORMAL LIMITS	054	130			
05/01/74	000 WITHIN NORMAL LIMITS	066	134			
06/01/73	060 VENTRICULAR PREMATURE CONTRACTIONS 310 NOTCHED T WAVES	068	160			
07/01/72	061 MULTIFOCAL VPC'S 063 VPC'S WITH COUPLING	058	150			
06/01/71	000 WITHIN NORMAL LIMITS	057	135			
06/01/70	000 WITHIN NORMAL LIMITS	065	160			
06/01/69	000 WITHIN NORMAL LIMITS	063	160			
07/01/67	000 WITHIN NORMAL LIMITS	078	146			

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OF POOR QUALITY